



# **Virginia Compendium of Superfund National Priorities List Site Fact Sheets**

**March 2003**



**Office of  
Remediation Programs**



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*Cover photo: Avtex Fibers Site, Front Royal, VA (courtesy FMC Corporation)*



## **Section One -- Private NPL Sites**



# Abex Corporation

Portsmouth, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Former Brass and Bronze Foundry

**Contaminants:** Lead (primary)

**Funding:** Enforcement-funded

## Site Description and History

The Abex Corporation Superfund site is in a residential area in the eastern section of the City of Portsmouth. The largest residential area affected was the Washington Park Public Housing Development found north and west of the foundry. The complex housed approximately 160 families. Soil contamination was also found in a two-block area of 20 private homes southwest of the foundry.

From 1928 to 1978, the foundry melted used railroad car journal bearings supplied by railroad companies and recast the material into new bearings. Spent casting sand laden with heavy metals (primarily lead) was disposed in a one-acre area north of the foundry facility. The foundry furnace operation also produced stack emissions of fine particulate material associated with facility processes.

In 1986, EPA identified high lead concentrations in the foundry waste, in soil around the process area, and in off-site soil in residential lots next to the site. In August 1986, EPA entered a Consent Order requiring Abex Corporation to excavate and remove contaminated surface soil from specified areas, cover two disposal areas with asphalt, and erect security fences. Restoration by seeding and sodding was also required at unpaved areas where soil was excavated. On October 10, 1989, the Virginia Department of Environmental Quality (VDEQ), serving as the lead agency, entered into an Administrative Order on Consent, requiring Abex Corporation to conduct a Remedial Investi-



*Abex Corporation - Remediation Activities*  
Photo by EPA

gation / Feasibility Study (RI/FS). The report was completed in February 1992. Abex Corporation conducted a removal action in March 1992, and lead-contaminated soil was removed from some residential areas. The Record of Decision (ROD), which formally outlines the cleanup action for Operable Unit 1, was signed on September 29, 1992. The ROD identifies two Operable Units (OUs).

- OU-1 consisted of contamination in the soil and waste sands at the site, the soils in the surrounding properties within a 700-foot radius of the site, and demolition of the facility buildings.
- OU-2 included further investigation of soils beyond the 700-foot radius, groundwater, and ecological impacts.

An Amendment to the ROD was issued in August of 1994. A formal letter of concurrence was sent by VDEQ on August 9, 1994. The revised remedy was based upon the premise that a residential neighborhood, a playground and some row houses would be rezoned commercial/industrial, and the institutional controls described in the remedy be in place no later than the completion of the preliminary remedial design for the remedy.

The major requirements of the remedy are:

- Excavation and removal of lead-contaminated soil above 500 ppm in residential areas not addressed in the March 1992 removal to the water table.
- Excavation and removal of soil contaminated with lead above 500 ppm in the top foot, and additionally soil contaminated with lead above 1000 ppm between one foot and two feet in commercial and/or industrial areas, with a synthetic warning layer placed below that.
- Demolition and removal of all structures associated with foundry operations on the Abex Lot, including excavation, stabilization, and off-site disposal of contaminated soils there.

The ROD also requires stabilization of soils, as necessary, temporary relocation of residents, as necessary, air monitoring during operations, placement of clean backfill, and revegetation.

In December 1995, the Abex Corporation, the City of Portsmouth, and the Portsmouth Redevelopment and Housing Authority (PRHA) agreed to design and conduct the cleanup work by signing a Consent Decree with EPA.

EPA approved final Remedial Design Work Plan for the Abex Corporation Superfund site. The Remedial Design Work Plans outlines the design and plan for action for the site cleanup EPA selected and described in the Record of Decision. The work plan addresses the following cleanup activities:

- Plans for digging up and treating the contaminated soil on the site.
- Plans for demolishing the former Abex Corporation Foundry Buildings. The foundry demolition was conducted in April and May 1997.
- Temporary relocation arrangements for residents affected by the cleanup work.



## **Threats and Contaminants**

Lead is the contaminant of principal concern at the site due to its known health effects and widespread presence in surface and subsurface soil in the residential areas and the foundry properties. Other contaminants present, along with lead, at levels of concern in residential areas include antimony, nickel, tin, copper, and zinc. These contaminants are all known to be present in the waste sands from the foundry operation. Other contaminants present at levels of concern on the foundry property, and in adjacent disposal areas, include cadmium, chromium, silver, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).

## **Cleanup Approach**

The site is being addressed in three stages: immediate actions and two long-term remedial phases focusing on a cleanup of contaminated soil near the foundry and cleanup of other site related soil, groundwater, surface water, and sediment contamination identified. The major cleanup activities at the site includes the following:

- Demolishing the former Abex Corporation Foundry Buildings.
- Digging up all contaminated soil on site.
- Treating the contaminated soil on-site using stabilization technology (mixing excavated soil and waste material with chemicals).
- Transporting the treated soil to an off-site landfill and replacing it with clean fill.
- Capping or covering areas with residual contamination, including with asphalt pavement and possibly permanent municipal buildings that are slated for construction.

## **Current Site Status**

Abex Corporation conducted a removal action in March 1992 and lead-contaminated soil was removed from residential areas. The September 1992 ROD for Operable Unit 1 (OU-1) addresses the cleanup of contaminated soil and waste material within a 700-foot radius of the site, which includes the former foundry buildings. The selected remedial action for OU-1 addresses the principal threat at the site by excavating and treating the highly contaminated soils and waste material and by demolishing the buildings associated with the former foundry operation.

A five-year review for OU-1 was issued Summer 2002.

Operable Unit 2 will further investigate groundwater, offsite ecological impacts, and the need for additional remediation of soil contamination attributable to Abex operations beyond the 700-foot radius. Contaminated soils for residential and playground areas beyond the 700-foot radius will be excavated under a removal order. It is possible that groundwater and ecological impacts will be included in the removal order.

## **Community Relations and Concerns**

Area citizens, civic leaders, and local officials are quite concerned about the past and present health effects of lead. Several meetings have been held with them to listen to their concerns and

suggestions. Supplemental lead education and prevention materials have been researched and disseminated.

Informal workshops and small-group meetings have been held often with local residents and officials. Community Relations staff members stay in contact with Portsmouth City officials on a regular basis. The Community Relations Plan was updated by EPA for the Remedial Design/Remedial Action (RD/RA). Concerns include the removal action, the disruption from construction during remedial activities, the health effects from lead, especially in children, and the effect on property values.

Interest levels increased in response to the ROD. Under the terms of the settlement of a separate judicial process, the residents of Washington Park Housing have been permanently relocated, and the former housing complex will be demolished.

EPA held a public availability session September 2001, including a presentation of the current site status and plans for the future.

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# Arrowhead Associates

Montross, Westmoreland County, Virginia

Superfund Program Site Fact Sheet

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<b>Type of Facility:</b>	Former Metal Plating Operation
<b>Contaminants:</b>	Cyanides, Heavy Metals, Volatile Organic Compounds (VOCs)
<b>Funding:</b>	Enforcement Financed

## Site Description and History

Located two miles southeast of the town of Montross, Virginia, the Arrowhead Plating site occupies approximately thirty acres of land in Westmoreland County. The Scovill Corporation (Scovill) leased the property from Westmoreland Industrial Development Corporation in 1966. In 1972, Arrowhead Associates purchased the business and facility assets and, subsequently, subleased the property from Scovill. In 1983, Arrowhead reopened business under new ownership as the A. R. Winarick Company. Mattatuck Manufacturing in 1997 purchased the building. Westmoreland Development Corporation owns the water supply system and other portions of the property.

From 1966 to 1979, the facility manufactured cosmetic cases using electroplating, lacquering, and enameling processes. Arrowhead Associates stopped these manufacturing operations in 1979 but added a cosmetic-case filling operation, which is still being performed at the facility. In the early 1980s, Mattatuck Manufacturing began manufacturing automobile wire harnesses at the site and, in 1988, Virginia Elastics started using the former plating areas as warehouse space. In July 1986, Scovill and the Environmental Protection Agency (EPA) entered an Administrative Order of Consent that required Scovill to conduct a two-phase removal action. The site was listed on the National Priorities List on February 15, 1990.

The Virginia Department of Environmental Quality (VDEQ) and EPA signed a Record of Decision in September 1991. The selected cleanup alternative involved treatment of contaminated ground water and contaminated soils. It called for contaminated ground water to be pumped and treated by a combination of precipitation, air stripping, and carbon adsorption, and contaminated soils to be treated by in situ vapor extraction. The Agency for Toxic Substances and Disease Registry conducted a Preliminary Health Assessment in March 1991. The assessment determined the site was a potential public health concern because of the potential for exposure to metal contaminants in the shallow aquifer. The special notice letters and draft Consent Decree were sent in May 1992 to the potentially responsible parties. A Consent Decree was signed with Scovill in September 1994. Also, a removal action was carried out in early 1997 inside the unused portion of the on-site building. EPA removed 450 drums and smaller

containers holding benzene, paints, lacquers, thinners, and lipstick that A. R. Winarick left at the site.

The site was divided into two operable units (OU-1 and OU-2) in 1998. OU-1 covers the soil remediation and OU-2 covers the ground water remediation. The Excaliber Group took over the remedial design work of OU-1 from ICF Kaiser Engineers Incorporated. The remedial design was completed in September 1999, and the soil vapor extraction system was constructed by December 1999. After testing the system, a construction completion inspection was held on March 30, 2000.

The Golden Sierra Company, now GeoSierra, took over the remedial design work of OU-2. The EPA issued an Explanation of Significant Difference (ESD) for OU-2 in October 1998 to replace the pump and treat system with a permeable reactive subsurface barrier (PRSB) to remediate the ground water at the site. A ROD Amendment was signed in September 2001 to add a cap up-gradient of the PRSB. This cap was placed over the area where the domestic sewage treatment plant had been located. The Remedial Design Report for the PRB and cap was completed in January 2002. The construction was completed in September and a construction completion inspection was held on September 23, 2002.

### **Threats and Contaminants**

High levels of VOCs in the ground water at the site still pose a significant threat. The contamination plume extends off site, into Scates Branch and the South Fork Scates Branch where ground water discharges to the streams. Surface soil sampling did not show a widespread presence of contamination; however, VOCs, metals (especially cadmium, copper, nickel, and zinc) and cyanide were found in a few locations. In subsurface soil, high levels of VOCs were found in two former storage areas and in one of the former disposal ponds, which could act as sources of low-level threats to the underlying aquifer. Also, in the subsurface soil, heavy metals were detected in the former disposal ponds.

### **Current Site Status**

The OU-1 soil vapor extraction system will continue to operate as long as necessary. Monitoring is being conducted on the performance of the OU-2 PRSB and will continue as long as the ground water remains contaminated.

### **Community Relations and Concerns**

A public meeting was held June 12, 1990, to answer questions about the site, and the Proposed Remedial Action Plan public meeting was conducted in August 6, 1991. VDEQ Community Relations staff conducted community interviews in February 1992 and updated the Community Relations Plan for Remedial Design/Remedial Action in April 1992. A public meeting was held on August 16, 2001 on the OU-2 Proposed Plan for the cap and PRSB remediation.

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# Atlantic Wood Industries

Portsmouth, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Wood Preserving

**Contaminants:** Creosote, Pentachlorophenol (PCP), Chromium, Arsenic

**Funding:** Enforcement financed

## Site Description and History

Atlantic Wood Industries operated a wood preserving facility on a 47.5-acre site along the Elizabeth River in Portsmouth, Virginia, from 1926 to 1990. Both creosote and PCP processes were used. The site was placed on the National Priorities List (NPL) on August 30, 1990.

Concern at the site is focused on raw material, finished product storage areas, and the plant processing area. Waste present includes soils contaminated by leakage from four aboveground tanks containing waste liquid creosote, 20,000 cubic feet of land filled creosote, and PCP contaminated wood chips. Groundwater is not used as a water source within a three-mile radius of the site. Public utilities supply water in this area. In 1986, Atlantic Wood Industries removed (removal #1) the four aboveground storage tanks containing 350,000 gallons of liquid creosote waste. Under a Consent Order with the Environmental Protection Agency (EPA), the facility excavated and sealed the storm sewer system next to Elm Avenue.

Work on the storm sewer project was completed in the summer of 1995, reducing contaminant infiltration in the groundwater and surface runoff into the Elizabeth River. Contaminated sediment at the outfall from the storm sewer system (removal #2) next to the Elizabeth River was also removed. Contaminated soil generated in the storm sewer and outfall removal project, as a part of OU-1, was stored on site in lined containers to be processed with the rest of the soils to be remediated. Since the OU-1 phase is still in the Remedial Design (RD) phase, those stored soils were removed and disposed separately in 1997.

The Record of Decision (ROD) for OU-1 (contaminated soils) was signed on September 29, 1995. The ROD identified ex-situ bioremediation of the soil with on site placement as the optimum plan. The alternate plan, should the optimal plan not reach minimum acceptable standards, is designated to be low temperature thermal desorption.

## Threats and Contaminants

Benzene, toluene, xylenes, and naphthalenes have been detected in the air. Creosote, pentachlorophenol (PCP), and other contaminants from former wood treating processes have been detected in the groundwater and soils. Polynuclear aromatic hydrocarbons (PAHs) are in-site sediments. Off-site sediments also contain phenol and PCP. PCP, arsenic, and chromium have been detected in surface water near the site. Direct contact or ingestion of soil on site could harm people. Coming in direct contact with materials that have moved off site or inhaling dust from the site also poses a threat to health. Oyster beds are within three miles downstream. Studies by the Virginia Institute of Marine Science have shown that oysters within this distance have accumulated levels of creosotes.

### **Current Site Status**

The ROD for OU-1 was signed on September 29, 1995. It consists of remedial work involving surface soils, sediments, and dense non-aqueous phase liquid in the subsoils on site. The selected remedy was ex-situ bioremediation of soils. The Norfolk District of the U.S. Army Corps of Engineers (USACE) is proceeding with the scope of work for the RD on OU-1. The U.S. Navy has acknowledged some responsibility for pollution near the site and has agreed to cooperate with Atlantic Wood and USACE in the cleanup of the site. All parties involved met and field-reviewed the site in January 1998.

The groundwater on site is covered under OU-2. The EPA tentatively approved the work plan for the remedial investigation at OU-2 in a letter dated November 20, 1998. OU-3 addresses the water quality impacts of the site on the Elizabeth River.

The National Oceanographic and Atmospheric Administration (NOAA) is currently preparing a sampling plan for OU-3. The sampling plan is intended to determine contamination from the Atlantic Wood Site on the south branch of the Elizabeth River. Ultimately, the study results are intended to help in developing site-specific cleanup levels.

### **Community Relations and Concerns**

This facility has been named as a pollution source to the Elizabeth River in studies by the Chesapeake Bay Foundation and the Virginia Institute of Marine Science. A very strong anti-incineration citizen's lobby resides in the area. If incineration is chosen as a soil remedy, organized public opposition is expected.

The Community Relations Plan for the site was updated in January 1991. On July 8, 1995, a public hearing was conducted near the site in Portsmouth, Virginia. Public comments were collected and answered on the project before the end of the comment period for OU-1.



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# **Avtex Fibers**

## **Front Royal, Warren County, Virginia**

### **Superfund Program Site Fact Sheet**

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**Type of Facility:** Former Rayon Manufacturing Operation

**Contaminants:** Carbon Disulfides, Phenols, Arsenic, Cadmium, Lead, Sulfides, Polychlorinated Biphenyls (PCBs)

**Funding:** PRP Lead

#### **Site Description and History**

Avtex Fibers is a 440-acre site in Front Royal, Virginia. The former rayon manufacturing plant operated under various owners, including American Viscose from 1940 to 1963, the FMC Corporation from 1963 to 1976, and Avtex Fibers, Incorporated until 1989 when the plant closed and Avtex declared bankruptcy. For short periods, the plant also produced polyester and polypropylene. Operations ceased on November 10, 1989, when the State Water Control Board revoked a water discharge permit.

In 1982, carbon disulfide was identified in groundwater samples from residential wells across the Shenandoah River from the plant. This finding initiated several site investigations that led to interim remedial measures implemented by Avtex in 1983 and 1984 to address the identified contamination. These measures included the purchase of some properties and groundwater pumping and treatment program for contaminant recovery and containment. The site was listed on the National Priorities List (NPL) on June 1, 1986.

The plant held a National Pollutant Discharge Elimination System (NPDES) permit to discharge its effluent into the Shenandoah River. From 1987 to 1988, many NPDES permit violations occurred. In 1989, PCB contamination in the Shenandoah River was linked to Avtex and the plant's NPDES permit was revoked. Following this action, the Avtex Fibers plant shut down.

On February 1990, EPA issued a Unilateral Administrative order (UAO) to FMC, including requirements to operate the wastewater treatment plant to protect the Shenandoah River. In the fall of 1997 EPA initiated a Time-Critical Removal Action (TCRA) to remove approximately 20 acres of buildings which were rapidly deteriorating and causing potential health and environmental problems. EPA completed the demolition of the buildings in the fall of 1998. FMC agreed to take over remediation of the site at that point. The Consent Decree was signed and became effective in October 1999, which makes the site a PRP lead. FMC now conducts site activities under the Consent Decree, not UAOs.

Site ownership was transferred to the Economic Development Authority of Front Royal and Warren County (EDA) in the spring of 2000.

### Threats and Contaminants

The groundwater is contaminated with carbon disulfide, phenol, sodium, and heavy metals, including lead, arsenic, and cadmium from waste deposited in the viscose disposal basins. The soil is contaminated with carbon disulfide, phenol, arsenic, lead, and PCBs. The Shenandoah River contains PCBs from the plant. Direct contact and/or ingestion of contaminated water or soil and dust inhalation from the site may threaten public health.



*Photo by Berry Wright*

### Current Site Status

Work currently being performed on all remediation activities involving the site is being implemented by the PRP, with EPA and VDEQ oversight. Those activities include:

**TCRA Buildings:** The PRP has sorted, processed, and disposed of the most of the demolition material generated from the 20 acre building demolition operation. Some piles of fine fraction materials remain on site pending determination of its appropriate disposition.

**NTCRA Buildings:** In December 2001, EPA selected a response action to decontaminate the remaining buildings and remove remaining sewers. FMC began decontaminating remaining buildings in January 2002. As FMC works on cleanup, the Corp of Engineers is also onsite as a

separate, non-superfund project, conducting asbestos abatement, other cleanup activities, and the demolition of the remaining building. FMC was conducting PCB abatement activities in the polymer building during the Winter 2002-2003, prior to its demolition by the Corps planned for the Spring 2003. The power plant will remain for future demolition.

**NTCRA Basins Closure:** Closure plans are complete and are being implemented to close the 5 sulfate basins, the WWTP (2 polishing ponds and emergency lagoon), the Fly Ash Basins, and the Fly Ash stockpile. A landscaping plan to return the area to a natural state has been developed. In September 2001, FMC hosted a workshop to develop and refine plant species selection and planting schedules for the closure basins. Experts from various agencies across the state participated.

**OU-7 (ROD-5) Viscose Basins 9-11, groundwater and surface water:** This unit is in the RI/FS stage. There is a plume of contamination associated with this phase of the project. A deep well investigation began in late Fall 2002 to further characterize the plume. This is anticipated to be the last ROD for the site.

**OU-10 (ROD-4) Viscose Basins 1-8, the new landfill:** This unit is near completion of the RI/FS phase of work. The ROD, to define the course of action for remediation, should be completed in 2003.

**OU-8 (ROD-3) Areas B and C:** In August of 2000, the areas B and C in the front of the site were taken to the public for review and comment. The ROD identified institutional controls with deed restrictions as the remedy. The requirements of the ROD are being implemented through a December 1999 Conservation Easement. These areas are within EDA's planned business park redevelopment.

### **Community Relations and Concerns**

Prior to the signing of the Consent Decree 1999, EPA conducted traditional community relations. Several public workshops were held for the community and local officials after the site was listed on the NPL. Meetings were held to discuss field investigations and to discuss proposed response actions plans. With the plant shutdown, community relations activities increased. EPA opened a public information center. Fact sheets were sent out and site tours were been provided periodically as a means of updating the public on site progress. An EPA Technical Assistance Grant was awarded to a local group, the Friends of the Shenandoan River. A technical advisor was selected by the group to help them interpret site data. The grant ended in 1994.

In February 1999, EPA, VDEQ, FMC and the EDA began sponsoring a multi-stakeholders group (MSG) to facilitate public participation and input into the cleanup and redevelopment of Avtex. The MSG provides an interactive forum where a broad group of interested parties are updated on site activities and can consider site-related issues critical to the future of the area. MSG members include local officials, community members, environmental and business group representatives, and municipal planners. The last stakeholder group meeting was held in October 2001. In addition to the regular MSG meetings, EPA and FMC's contractors performed a door-to-door

outreach to nearly 300 homes in June 2001. Through these community relations efforts, various parties were provided an opportunity to raise issues and concerns relative to the site.

Other public interest events have been held at the site. Open houses that provide informational displays on cleanup progress and future plans and site tours to interested parties were conducted in July 2001 and October 2002. In April 2002, local elementary school children helped plant trees on a closed basin.



*Photo by Dave Gillispie*

In addition to potential health and environmental risks, local resident concerns include odors coming from the site and their health impacts, concern that residential soils have not been tested, concern that sulfate waste located in the 100-year flood plain and adjacent to the River is being closed on-site, and concern that information in the administrative record is difficult to locate. Local officials and business group representatives have expressed concern with the length of time it takes to clean up a site and the desire to delist parcels of land from the Avtex Superfund site.

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# Buckingham County Landfill

Buckingham, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Landfill and Hazardous Waste Disposal Area

**Contaminants:** Volatile Organic Compounds and Metals.

**Funding:** Enforcement Financed

## Site Description and History

Buckingham County Landfill (BCL), formerly Love's Container Service, is approximately 8 acres, including a 2-acre hazardous waste disposal area. The site is on 125 acres of wooded land, surrounded by land used for timber harvesting, agriculture, mining, and growing residential development. Two tributaries border the property: Cooper Creek to the north and Warner Branch to the south.

Buckingham County Landfill was owned and operated by Mr. Joseph Love from 1962 to 1982. Mr. Love started the landfill by collecting household refuse and, in November 1972, the Virginia State Board of Health (SBH) issued a Sanitary Landfill Permit. In 1977, Mr. Love's permit was modified to allow 200 gallons per month of hazardous waste. In 1979, the solid waste portion of the landfill was closed to the satisfaction of SBH. SBH also approved an increase in quantities of hazardous waste to 40,000 gallons per month. In 1981, the site received interim status as a hazardous waste disposal facility under the Resource Conservation and Recovery Act (RCRA). In 1982, Buckingham County purchased the landfill from Mr. Love and the landfill was closed in 1983.

The site was listed on the National Priorities List (NPL) in April 1989. The Remedial Investigation/ Feasibility Study (RI/FS) started in February 1991 and was completed in May 1993. A Record of Decision (ROD) was issued in September 1994.

Thomasville Furniture, Prillaman Chemical, Westinghouse, Champion International Corporation, and the County of Buckingham are the Potentially Responsible Parties (PRPs). In response to the Responsible Party (RP) and community opposition, in November 1993, EPA issued an addendum to the Proposed Plan. Subsequent negotiations generated a de minimis settlement, and in September 1995 a de minimis Consent Decree was issued to Champion International Corporation, Buffalo Air Handling, and Westinghouse Electric. These parties agreed to a cash-out settlement. A cash-out settlement was also reached with Prillaman Corporation, while Buckingham County, as an RP, is expected to provide "in kind" services, including site access and site fencing upkeep.

In September 1995, a Unilateral Administrative Order (UAO) was issued for Thomasville Furniture, the remaining RP, to perform all of the work for the Remedial Design/Remedial Action (RD/RA), as laid out in the ROD. Thomasville and Prillaman had previously determined their allocation portions to be 85% and 11.5%, respectively. The remedy selected was capping and ground water monitoring. If contamination occurs at compliance wells, then, the cap will be removed and source control measures taken, along with a pump and treat system.

Following approval of the work plan, the site entered the RA phase. A multi-layer cap was constructed over the 2-acre landfill containing hazardous waste. The multi-layer cap prevents rainwater from moving through the waste and further contaminating the ground water. Construction of the landfill cap began in April 1998 and was completed in June 1998. The final inspection of the cap was conducted on September 29, 1998.

Additionally, the ROD required a ground water study in order to gain sufficient information to effectively design the long-term ground water monitoring program. This study included five rounds of ground water sampling which were conducted between May of 1996 and June of 1997.

EPA issued a UAO to Buckingham County in March 2002 after spending nearly two years requesting comments on a draft CD. In December 2000, the County implemented the provisions of the UAO.

### **Threats and Contaminants**

Sampling during the RI and from the Additional Ground water Study (completed in June 1997) indicated on-site monitoring wells are contaminated with VOCs from former disposal practices. The source of this contamination is the hazardous materials buried in the on-site trenches. Risks exist if individuals ingest or contact this contaminated ground water.

### **Current Site Status**

EPA approved the final long-term ground water monitoring work plan in April of 1998. Quarterly ground water sampling started in September 1998 and continues. EPA also plans a hydraulic evaluation of the site in 2003 to determine the current migration potential of contamination.

### **Community Relations and Concerns**

On March 10, 1992, a media availability session at the site, a meeting with county officials, and the RI/FS kickoff meeting was held. In July 1992, VDEQ reviewed the Community Relations Plan. On May 25, 1993, a public meeting was held to present the original Proposed Plan. Approximately 600 to 700 people attended, making it one of the largest Superfund public meetings ever held in Virginia. On March 25, 1998, a second public meeting was held to present the Remedial Action activities to be conducted at the site.



<b>VDEQ Representative</b>	<b>Information Repository</b>
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# C & R Battery Company

Chesterfield County, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Battery Reclamation

**Contaminants:** Lead

**Funding:** Enforcement Financed

## Site Description and History

The C & R Battery Company facility, a four-acre site in Chesterfield County, Virginia, was in operation from the early 1970s to 1985. The process at the site involved breaking open old automotive batteries and removing the lead for resale.

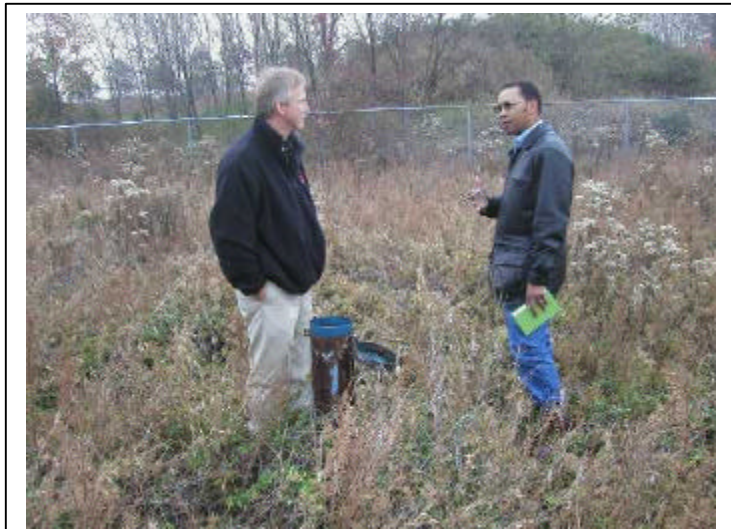
Contaminated areas at the site included the battery breaking area, an acid storage containment area, and a material stockpiling area for storing reclaimed and scrap lead. Soil over the entire site was lead-contaminated. Soil samples had a pH range of 3.5 to 12.3. However, groundwater at the site was determined to show no effects of contamination. This site consisted of one Removal Action (RA) and one Operable Unit (OU-1). In 1986, the Environmental Protection Agency (EPA) conducted the RA at the site. The RA included addition of lime to soils and pools of acid to neutralize acidity; installation of surface water drainage controls and grading of the site; and construction of a fence around the most contaminated areas to limit site access. The site was placed on the National Priorities List (NPL) on July 1, 1987.

The Remedial Investigation/Feasibility Study (RI/Fs) for OU-1 started in March of 1990, when a Record of Decision (ROD) was signed. ROD required excavation of approximately 36,800 cubic yards of lead- contaminated soils for stabilization, solidification, and disposal of the treated material in an off-site solid waste landfill. The Remedial Design (RD) started in the fall of 1990 and was completed in March 1992. A Unilateral Administrative Order was issued to 17 Potentially Responsible Parties (PRPs) in March 1992. A meeting took place on April 15, 1992, between EPA and the PRPs' representatives to discuss their concerns. In April 1992, one party, the C & P Telephone Company of Virginia, Incorporated, agreed to comply with all of the terms and conditions of the order.

## Threats and Contaminants

Before the RA, there were several contaminant pathways. Air monitoring, at several workstations during battery-breaking operations, indicated lead contamination levels well above the federal standards. Lead contamination in on site soil was found throughout the site to a depth

of six feet. Groundwater below the site had not been affected, but surface water was contaminated with heavy metals and acids. Health risks existed from possible ingestion or direct contact with contaminated soil and surface water, or inhalation of the air during facility operations. Before 1986, during routine health screenings, some company employees were found to have elevated levels of lead in their blood. There was also an ecological threat to the James River and its tidal wetlands and concerns for the people who frequent the river. The river has shown no sign of contamination from the site.



*Photo by Dave Gillispie*

### **Current Site Status**

The RA started in April 28, 1993, and was completed on September 28, 1993. Approximately 49,000 tons of soil was stabilized and disposed off site. The site has been backfilled with clean soil and revegetated with grass. Geraghty and Miller submit quarterly monitoring reports on the site to ensure that the remedy is complete. Samples were taken from the area where above ground oil tanks had been removed on the Capital Oil Company portion of the site. Resulting sample analyses confirmed no lead contamination exists in the area. However, the EPA recommended that the Commonwealth LUST (Leaking Underground Storage Tank) Program scrutinize the high levels of hydrocarbons identified in the soil. It appears the site is remediated and stabilized. To ensure future protection of health and the environment in the area, periodic groundwater sampling continues due to high manganese levels detected in wells at the site over an extended period of time.

Verizon, a responsible party at the site, submitted a study to EPA that examines the groundwater manganese levels. At issue is whether groundwater monitoring should be continued at this site. The need for deed restrictions may also be removed through an Explanation of Significant Differences document. EPA is anticipating delisting this site from the NPL in the near future.

Site inspections are conducted periodically to ensure the site is stabilized. The second Five Year Review site inspection was conducted November 2002.

### **Community Relations and Concerns**

The Proposed Plan public meeting was held in February 1990. There was a moderate turnout with no opposition to the plan. On May 5, 1992, and December 21, 1992, local officials attended briefings to discuss the status of the RD and RA. On January 19, 1993, a public meeting was held at Bellwood Elementary School to update citizens on remedial activities. Representatives of

Chesterfield County requested to be updated regularly on site issues. When the RA ended, a press release was sent to the local media and a fact sheet was mailed to citizens and legislators.

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# Chisman Creek

York County, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Fly Ash Disposal Area

**Contaminants:** Vanadium, nickel, arsenic, selenium, and traces of other metals

**Funding:** Enforcement Financed

## Site Description and History

The Chisman Creek Superfund Site is in southeastern York County, in a sub-watershed of Chisman Creek, a tributary of the Chesapeake Bay. The site is approximately 30 acres and has four abandoned sand and gravel pits filled with fly ash from the Virginia Power Company's Yorktown Power Generating Station. The site also includes a freshwater tributary that connects three ponds and drains into the Chisman Creek estuary.

Between 1957 and 1974, an estimated 500,000 tons of fly ash, from Virginia Power's Yorktown Power Station, was disposed in the borrow pits. The site was included on the National Priorities List (NPL) in September 1983. EPA completed a Remedial Investigation/Feasibility Study (RI/FS) and Public Health and Environmental Evaluation in August 1986. The contaminants were found to have leached out of the fly ash contaminating ground water, surface water, sediments, and soil.

In September 1986, EPA issued a Record of Decision (ROD) for Operable Unit 1 (OU-1) calling for remediation of Pits A, B, C, and associated ground water. The selected remedy for OU-1 includes: soil covers for Pits A, B, and a clay cap for Pit C; installation of a subsurface drain system and on-site treatment of collected ground water at Pit C; installation of a municipal water supply for area residents; restrictions on the use of contaminated the ground water in the vicinity of the site; and post closure monitoring. Virginia Power signed a Consent Decree in September 1987 agreeing to implement the ROD and completed construction of the Remedial Action (RA) in December 1988. Pit A was developed as a soccer field and Pit C as a baseball field.

The U.S. Fish and Wildlife Service completed the OU-2 Remedial Investigation (RI), focusing on the adjacent ponds, streams, and the Chisman Creek estuary, in September 1987. Virginia Power submitted the Feasibility Study (FS) in January 1988. In March 1988, EPA issued the OU-2 ROD. The selected remedy includes modification of surface drainage near Pond A and the continued monitoring of the ponds, stream, and estuary. In October 1988, Virginia Power signed a Consent Decree agreeing to implement the ROD. All modification work was completed by June 1989.

Virginia Power closed down the on-site ground water treatment plant and started to discharge to the Hampton Roads Sanitation District (HRSD) wastewater treatment system in 1993. EPA issued an Explanation of Significant Differences (ESD) in March 1994 to document this change in the remedy. EPA conducted a five-year review in 1996 and determined that the remedial actions are operating properly and continue to be protective to human health and the environment.

### **Threats and Contaminants**

Vanadium, nickel, arsenic, selenium, and sulfate have been found in ground water near the four fly ash pits. Surface water in Chisman Creek showed contamination with vanadium, nickel, and sulfate. Although drinking contaminated ground water could have posed a risk to the public, this risk has been reduced because the houses with contaminated wells were connected to the public water supply. The subsurface fly ash and pond sediment materials do not pose a public health threat in their present, sheltered location. However, nearby estuaries could be potentially threatened by site contamination.

### **Current Site Status**

Construction of the remedies has been completed, and the site redeveloped as Chisman Creek Park. Ground water monitoring will continue. EPA conducted a second five-year review in November 2001 and determined that a more permanent restriction must be put into place to prohibit ground water use at the site. EPA is working with Virginia Power to amend the restriction to be more protective.

Also, a second ESD is being drafted to update the OU-1 clean up criteria for arsenic and nickel. After the remediation is completed, the site will be considered for NPL deletion.

### **Community Relations and Concerns**

With construction of the ball fields, community relation activities have decreased. A dedication ceremony was held to celebrate the opening of the Chisman Creek and Wolftrap parks in May 1991. Before this dedication, EPA drafted a fact sheet and mailed it to the community.

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# Culpeper Wood Preservers

Culpeper County, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Wood Preserving Operation

**Contaminants:** Arsenic, Chromium, and Copper

**Funding:** Enforcement-financed

## Site Description and History

The Culpeper Wood Preservers (CWP) occupies approximately 20 acres of land. Several private homes are north and east of it. Approximately 8,750 people live within a three-mile radius of the site. CWP has been an active facility since 1976, pressure-treating wood with the preservative solution, chromated copper arsenate (CCA). Jefferson Home Builders, Incorporated, owned by Joseph Daniel, operates the facility.

The wood treatment at the facility is done by pressure-treating lumber in an enclosed processing unit. The wood is then moved to a drip pad and left to stabilize over a three-day period. Between 1976 and 1980, treated wood was stored outdoors for drying with no runoff protection.

In early 1981, approximately 100,000 gallons of CCA-contaminated wastewater escaped from an unlined impoundment contaminating neighboring surface waters, primarily Jonas Run. In February 1981, the Environmental Protection Agency (EPA) issued a complaint/compliance order to CWP. As a result, CWP removed contaminated soil, reconstructed the impoundment adding downgradient leachate collection trenches, installed drip pads under the processing unit, and installed monitoring wells. The site was listed on the National Priorities List on October 4, 1989.

## Threats and Contaminants

The ground water is contaminated with arsenic and chromium from the wood treatment processes, according to analyses conducted in 1981 by the Virginia State Water Control Board (SWCB). In 1983, contaminated soil containing chromium, copper, and arsenic was discovered at the site, and some may still remain. In 1986, the SWCB determined homeowners' wells were not contaminated. Risks exist for individuals who drink contaminated ground water or surface water.

Wastewater containing CCA has contaminated neighboring surface waters. An unnamed tributary, 750 yards northeast of the site and approximately three miles upstream of Jonas Run,

potentially could be contaminated. Contaminated ground water or surface water may affect recreation and fishing.

### **Current Site Status**

EPA completed the Remedial Investigation/Feasibility Study (RI/FS) work plan. Jefferson Home Builders, Incorporated, the Potentially Responsible Party (PRP), agreed to implement it and signed an Administrative Order on Consent in June 1993. A draft RI/FS was completed in February 1995. However, an impasse exists between EPA and the PRP over the findings in the RI.

In addition, there was a delay while EPA resolved the question of whether the storm water pond might be a Resource Conservation and Recovery Act (RCRA) unit. EPA has decided to advance the site through the Superfund process.

### **Community Relations and Concerns**

On December 30, 1992, members of the Culpeper Conservation Districts toured the site. The RI kick off meeting was held on October 6, 1993, and approximately 20 people attended.

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# First Piedmont Rock Quarry

Chatham, Pittsylvania, Virginia

Superfund Program Site Fact Sheet

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**Type of Facility:** Private Waste Disposal Area

**Contaminants:** Assorted Solvents, Lead, Cadmium, Barium, Arsenic, Zinc, Perchloroethylene, Hexavalent Chromium, Antimony

**Funding:** Enforcement Financed

## Site Description and History

The First Piedmont Rock Quarry site is along Route 719 in Pittsylvania County, Virginia, near the intersection of Route 360. It is approximately six miles north of the City of Danville, Virginia. The site is an abandoned rock quarry. The surrounding land is primarily a wooded, rural area. Directly across Route 719 and south of the site is the Beaver Park Community. The closest home is approximately 150 feet from the site. All of Beaver Park relies on groundwater wells or springs as a source of potable water. Approximately 455 people live within one mile of the site and 1,893 live within a two-mile radius of the site.

The site was initially operated as a quarry for crushed stone. The four-acre site consists of the abandoned quarry and adjacent land. The First Piedmont Corporation leased the site in April 1970 to be used as a landfill for industrial and agricultural wastes until April 1975. Waste was disposed in the landfill until July 1972, until the Virginia Department of Health ordered waste disposal operations to stop due to a fire at the site.

The landfill contains approximately 65,000 cubic yards of industrial and agricultural waste and approximately 3,000 cubic yards of soil used as a cover when the land filling stopped. The quarry soils are contaminated with lead, barium, arsenic, and antimony. Separate and apart from the landfill are three other areas of waste on the site; two are associated with the land filling operation. The carbon black pile, consisting of approximately 100 cubic yards of carbon black and zinc contaminated soils, is approximately 150 feet from the western edge of the landfill. The waste pile contains approximately 10 cubic yards of waste and is contaminated with lead. The waste pile is about 75 feet from the western edge of the landfill. Not associated with the land filling operations, the Old Disposal Area contains miscellaneous refuse including bottles, cans, and metal debris.

The site was listed in the National Priorities List (NPL) on July 1, 1987. The Record of Decision (ROD) was signed on June 28, 1991. The selected remedies for cleaning the site were: excavation and off-site disposal of the non landfill waste; off-site disposal of the surface drums and debris; installation of a Resource Conservation and Recovery Act of 1976 (RCRA) Subtitle

C caps over the landfill; and collection and treatment of the leachate. Remedial Action (RA) started on June 30, 1994, and was completed on September 29, 1995. EPA issued a preliminary close out of the up gradient site on September 26, 1995. The Potentially Responsible Parties (PRPs) identified for this site is Goodyear, Corning Glass, and the First Piedmont Corporation.

### **Threats and Contaminants**

Early sampling showed elevated levels of heavy metals including arsenic, cadmium, lead, and zinc from former disposal practices. Elevated levels of lead and zinc were found in surface water. Iron and manganese were detected at low levels in two of the residential wells, both up-gradient of the site. However, initial and subsequent investigations showed no immediate threats to residents. The threat to the near by Lawless and Fall Creeks due to migration/erosion of site-related contamination was eliminated through source control actions. Risks to individuals through ingestion or direct contact with contaminated leachate, surface water, or soils have been mitigated.

### **Current Site Status**

The site is currently in the Operations and Maintenance phases and a deed restriction applies. The site is subject to a long-term monitoring requirement. Collection and treatment of leachate operate continuously, treating approximately 40,000 gallons per month. PRPs have implemented a long-term monitoring program that includes analyses of groundwater and surface water. EPA is currently investigating down gradient contamination in area streams. This action is due to information found during the 5-year review. The adequacy of the remedy appears to be in question.

The PRPs are working on a work plan to perform an additional investigation to identify the source of the zinc in the stream adjacent to the site.

### **Community Relations and Concerns**

Citizens are concerned that groundwater contamination of private wells might occur in the future. Consequently, some residents requested that a water line be installed to homes near the site. In October 1993, EPA conducted residential well sampling and, on August 30, 1994, held a public meeting for the beginning of remedial action. A community field review of the completed site was conducted on November 16, 1995.

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# Greenwood Chemical Company

Newton, Albemarle County, Virginia

Superfund Program Site Fact Sheet

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<b>Type of Facility:</b>	Specialty Chemical Manufacturer
<b>Contaminants:</b>	Toluene, Naphthalene, Various Naphthalene Derivatives, Arsenic, and Cyanide
<b>Funding:</b>	Fund Financed

## Site Description and History

The Greenwood Chemical Company, an 18-acre site in Albemarle County, Virginia, manufactured specialty chemicals for approximately 40 years. After an April 1985 toluene explosion and fire that killed four workers, the facility ceased operations. Water and sludge from former lagoons, drums containing unknown wastes and materials in the drum disposal area (on the surface and buried), and contaminated soils were present at various locations on the site. The most prevalent contaminants were toluene, naphthalene, various naphthalene derivatives, arsenic, and cyanide.

The site was listed on the National Priorities List (NPL) on July 1, 1987. In April 1988, the Environmental Protection Agency (EPA) conducted a removal action at the site to stabilize and contain the hazardous wastes. Actions included:

- treatment of lagoon water and stabilization of lagoon sludge with fly ash
- over packing approximately 520 drums excavated from the drum disposal area
- construction of diversion/drainage ditches to reduce surface water run-on
- infiltration and erosion,
- installation of monitoring wells
- sampling and analysis of ground water from the monitoring wells and area residential wells

On-site ground water is contaminated, but area residential wells have not been affected at this time. Homes, farms, and community buildings are close to the site. Approximately 1,600 people, living within three miles of the site, are dependent on private wells as their source of drinking water. The site was split into four operable units (OUs) to facilitate the remedial work.

**OU-1** covered remediation of the shallow soils (less than 15 feet in depth). The Record of Decision (ROD) for OU-1 was signed on December 29, 1989, and identified off-site incineration and disposal as the preferred alternative. Soil removal from seven areas, including former disposal lagoons, pits and trenches was completed in August 1996.

**OU-2** relates to ground water and lagoon water. The ROD for OU-2 was signed on December 31, 1990. The treatment for the water was precipitation, ultraviolet oxidation, and carbon filtration. Construction on the Wastewater Treatment Plant was overseen by the U. S. Army Corps of Engineers (USACE) and completed in August 2000. EPA took possession of the facility in March 2002 after an initial test period. OMI, Inc. has operated the facility since it was constructed.

**OU-3** involves on-site buildings. An ESD was issued in July 1991 and addressed the removal of manufacturing buildings and their contents. The buildings were removed to access underlying contaminated soil as part of the OU-1 remedial action. Removal actions began on September 30, 1991, and were completed on October 15, 1993.



*Greenwood Chemical Company - Waste Water Treatment Plant  
Photo by Michael Bolton*

**OU-4** concerns the deeper contaminated soils (greater than 15 feet in depth) and also addresses certain arsenic contaminated soils on site. The operable unit is described in the March 1994 ESD for OU-1.

### **Threats and Contaminants**

Specific contaminants detected in on-site ground water and soils include volatile organic compounds (VOCs), such as toluene and chloroform. In addition, semi-volatile organic compounds (SVOCs), such as naphthalene, and inorganic contaminants, such as arsenic, are present from former plant operations. On-site lagoon sludge contains VOCs, such as toluene and benzene, and cyanide. Potential health threats include ingestion or direct contact with contaminated ground water, soil, and sludge contaminated with VOCs, SVOCs, and inorganic compounds.

### **Current Site Status**

**OU-2** - OMI, Inc. continues to operate the facility. Lagoons 4 and 5 will be closed as part of a final site-wide remedy and additional withdrawal wells may be added. A Focused Feasibility Study concerning the lagoons was completed in March 2003.

**OU-4** - A Focused Feasibility Study (FFS), including additional sampling is being prepared by the USACE. Several draft versions of the FFS were completed between September 2001 and July 2002, and the FFS will be finalized in spring 2003. In conjunction with the FS, a Proposed Remedial Action Plan (PRAP) is being prepared describing the preferred remedial alternative for the entire site and a draft plan will be issued in spring 2003. Routine sampling of site monitoring wells and off-site wells will continue.

### **Community Relations and Concerns**

A proposed plan meeting was held on November 8, 1990, and an update meeting on April 4, 1991. EPA and the State conducted community interviews for the updated Community Relations Plan between June 25 and 27, 1991. EPA hosted a community workshop on December 5, 1991, to discuss the upcoming building demolition.

The Piedmont Environmental Council was awarded a Technical Assistance Grant. The Greenwood Citizens Council and the Piedmont Environmental Council petitioned the Virginia Department of Health for a public meeting on the health assessment. The public meeting was held on September 16, 1993. Several public meetings were conducted during the construction phase of OU-1 Remedial Action (RA) in an attempt to find an incineration site.

An EPA/Agency for Toxic Substances and Disease Registry (ATSDR) public availability meeting was held on March 18, 1999 to discuss continued community health concerns over past site exposures.

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# H & H Burn Pit

## Farrington, Hanover County, Virginia

### Superfund Program Site Fact Sheet

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<b>Type of Facility:</b>	Former Disposal Pit for Dried Printing Inks, Solvents, and Resins
<b>Contaminants:</b>	Polychlorinated Biphenyls (PCBs), Benzene, Toluene, Beryllium, Manganese, Lead, MEK, and Acetone
<b>Funding:</b>	Enforcement Financed

#### Site Description and History

The H & H Burn Pit site is on Route 33 in Hanover County, Virginia, and was operated by H & H, Incorporated. Haskell Chemical Company used the one-acre site between 1960 and 1976 for the disposal of dried printing inks, solvents, and resins. These materials were transported to the site in drums, emptied into shallow, unlined pits, and burned. The Environmental Protection Agency (EPA) sampling in 1984 indicated that PCBs were being discharged off site through surface drainage. The site was included on the National Priorities List on March 31, 1989.

In 1982 in response to a State Order, H & H, Incorporated and the Haskell Chemical Company removed contaminated soil, installed monitoring wells, and took measures to control erosion and sedimentation.

In May 1992, EPA issued Mr. T. Frank Flipppo, current owner of the site, a Unilateral Order. The Order allowed EPA contractors, Ecology and Environment, Incorporated, to conduct more sampling to complete the Remedial Investigation Report. The Remedial Investigation/Feasibility Study (RI/FS) Report was completed in December 1993. The Proposed Remedial Action Plan (PRAP) was submitted in January 1994.

A Record of Decision (ROD) was signed in June 1995. The remedy called for excavation, treatment and off-site disposal of contaminated soil and sediment, and the extraction, treatment and discharge of contaminated ground water.

A Consent Decree and an Administrative Order by Consent were signed on September 30, 1996, by the Reynolds Metals Company and the Westvaco Corporation to conduct the remedial design and remedial action. At that point, the site changed from fund-financed lead (EPA) to enforcement-financed lead (Responsible Party). J.W. Fergusson & Sons, Inc. was added as a Potentially Responsible Party (PRP) in 1998.

In late 1996 the site was split into two operable units or OUs. OU-1 covered soil and sediment removal and OU-2 dealt with ground water contamination. In late 1996 and early 1997, the PRPs carried out a remedial investigation for a waste removal action. Also, Hatcher-Sayre, Inc. was hired to put together the remedial design work plan.

The Final Remedial Design Work Plan was completed in September 1997. This plan called for additional sampling, surveys, pilot tests, and reports. The first of these, the Source Removal Work Plan, was completed in September 1997 and the Ground Water and Soil Sampling Report was completed in January 1998.

The first phase of the OU-1 soil and sediment remedial action, source (soil) excavation and disposal from the unsaturated zone was completed in September 1998. Sediment sampling in the surface water channel was conducted in October 1998. This sediment removal was completed in May 1999.

In October through December of 1998, Hatcher-Sayre conducted aquifer testing and an air sparging/high vacuum extraction pilot study in preparation for treatment of ground water (OU-2). The results of these tests were presented in the Expedited Remediation Program and High Vacuum Extraction (HVE) Pilot Study Report completed in February 1999.



*H & H Burn Pit – Remediation Activities*  
*Photo by EPA*

An Explanation of Significant Differences (ESD) was signed in September 1999 to change the ground water remediation to HVE. The remedial design was completed in September 1999, and the remediation construction completion of the HVE treatment system occurred in May 2000.

Approximately 600 people live within a mile of the site. The nearest residence and the nearest well are about 1,000 feet from the site. About 2,400 people draw drinking water from private wells, within three miles of the site. Surface waters within three miles downstream of the site are used for fishing.

### **Current Site Status**

The OU-1 remediation is complete. The OU-2 HVE system will continue to operate as long as the ground water exceeds cleanup levels.

In January 2001, acetone and 2-butanone, also known as methyl ethyl ketone (MEK), started being detected in the influent to the treatment system in higher levels than anticipated. These compounds are not cost-effectively treated by the current treatment system. In fall 2001 the PRPs conducted a field investigation to determine the horizontal and vertical extent of acetone and MEK in ground water, and found that these compounds remain in the former burn pit area. In December 2002 the PRPs placed additional deeper wells to further assess the extent and concentrations of these contaminants.

### **Community Relations and Concerns**

A workshop was held on March 26, 1991, to update citizens on the Remedial Investigation/ Feasibility Study (RI/FS) Work Plan. A Technical Assistance Grant workshop was held June 3, 1991. The revised Community Relations Plan for the EPA contractor, Ecology and Environment, Inc issued the RI/FS in January 1992.

After completion of the RI/FS, EPA had a public comment period and held a public meeting in January 1994, to solicit PRAP comments from the public. EPA held a public meeting on November 25, 1997, to explain the Remedial Action to the local residents. A Remedial Action Construction Completion public event was held on October 26, 2000.

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# Kim-Stan Landfill

Alleghany County, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Sanitary (MSW) Landfill

**Contaminants:** Polychlorinated biphenyls (PCBs), mercury, aluminum, medical wastes and other contaminants associated with landfills

**Funding:** Fund Lead

## Site Description and History

The Kim-Stan Sanitary Landfill is situated on a 40.9-acre tract of land at the base of the northwest flank of the Rich Patch Mountains, where the mountains meet the alluvial floodplain of the Jackson River. The landfill was operated between November 1972 and the fall of 1988 as a privately owned facility that accepted an average of 30 to 40 tons per day of local municipal solid waste (MSW) from Alleghany County. During this 15-year period an estimated 140,000 tons of MSW was buried in an area 15 acres in size between the highway embankment for Route 696 and the base of the mountains. The maximum cut below existing grade about 15 to 20 feet, and the maximum fill thickness was probably no more than 40 feet.

The ownership and operation of the landfill changed in 1988. In 18 months between November 1988 and May 1990, when VDEQ terminated operations under court order, an estimated additional 725,000 tons of out of state baled and conventionally placed commercial MSW was buried at the site at rates that approached 2,000 tons per day. To accommodate this waste, the operations made a 50 to 100 foot wide horizontal cut into the shale bedrock at the base of the mountains forming a steep, high wall to the property line. MSW, up to 60 feet deep, has been placed directly against the base of this high wall cut. The MSW disposal area covers 24.3 acres, including isolated deposits outside of the landfill footprint, and reaches a maximum thickness of about 85 feet.

After shutting down operations, VDEQ coordinated emergency placement of soil over the site with VDOT. Subsequently, VDEQ contracted with CH2MILL to do a groundwater assessment study (1992) and to develop a site closure plan (1993).

The General Assembly of Virginia provided funding through VDEQ to Alleghany County to implement certain critical parts of the closure plan, including diversion of mountain drainage and base flow from the gully alluvium around the site. The first phase – installation of a pipeline to collect the drainage in the gully above the site and divert it to existing channels west of the landfill – was essentially completed August 2000. The next phase – which extends the pipeline

across State Route 696 and off-site – was completed the following year. The drainage improvement project has EPA's concurrence, and VDEQ worked closely with the County to assure this portion of the remedy would be consistent with future Superfund actions.

The site was added to the NPL in August 1999. The work plan for EPA's RI/FS was approved and sampling activities were conducted over the summer of 2000. The RI/FS was completed in the summer 2002.

### **Threats and Contaminants**

According to groundwater contamination assessments, approximately 36,000 gallons of leachate per day (gpd) is being generated in the landfill in its present physical condition. The rate of leachate generation is also expected to vary from 16,000 gpd during dry weather condition to around 75,000 gpd under wet weather conditions.

There are four sources of infiltrating water contributing to the production of leachate. Over 45% of the total leachate generated is caused by infiltration of precipitation directly through the surface of the landfill. Another 35% is generated by the infiltration of base flow from the alluvium in the Kim-Stan gully drainage off the mountain and from seepage through the unlined run-on diversion ditches along the uphill side of the landfill. Groundwater inflow accounts for the remaining 20% of the generated leachate.

### **Current Site Status**

The Record of Decision (ROD) was signed in September 2002. The remedy includes the following components:

- Consolidation of landfill wastes visible at the surface outside the landfill property boundary into the landfill property line;
- Installation of a leachate collection system (trench and barrier wall) which shall prevent the migration of leachate from the landfill property and contain such leachate within the landfill property boundary in a manner that will allow for removal and treatment of the leachate at an off-site facility.
- Installation of piping and associated equipment to convey the collected leachate to the Low Moor Waste Water Treatment Plant ("LMWWTP") for treatment.



*Kim-Stan Landfill, Stormwater Diversion Project  
Photo by Ward Robens*

- Performance of upgrades to the LMWWTP to facilitate adequate treatment of collected landfill leachate.
- Conveyance of collected landfill leachate to the LMWWTP and treatment of the leachate.
- Installation of a multi-layer cap atop the landfill that shall eliminate, or reduce to the maximum extent practicable, the infiltration of water into the waste and the resulting production of leachate and groundwater contamination.
- Routine monitoring of groundwater to document progress in meeting the groundwater performance standards and to determine the need for continued limits on groundwater use.
- Implementation of institutional controls to protect the integrity of the remedy and to prevent use of contaminated groundwater until the groundwater performance standards are achieved.

The work-plan for Remedial Design was approved January 2003 and is being implemented.

### **Community Relations and Concerns**

The Kim Stan Advisory Committee, a local citizens group formed to monitor activities at the site, received its Technical Assistance Grant from EPA in May 2000. The Committee meets once a month.

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# L.A. Clarke and Son

Spotsylvania County, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Former Wood Preserving Facility

**Contaminants:** Creosote and Components.

**Funding:** Enforcement Financed

## Site Description and History

The L. A. Clarke and Son site is in Spotsylvania County, Virginia, approximately two and a half miles south of Fredericksburg. The site encompasses approximately 40 acres. Creosote was used at the site for wood preserving operations between June 1937 and June 1988, except from April 1979 to June 1980. Until 1976 the property was owned by the Richmond, Fredericksburg, and Potomac Railroad (RF&P) and was leased out to L A Clarke and Sons, Inc. Wood preserved at the site was used for such products as railroad ties, telephone poles, and fence posts.

The process consisted of injecting the wood with a mixture of creosote and coal tar under high temperature and pressure. The heat and pressure forced the creosote mixture into the cells of the wood. Excess mixture was drained from the lined pits. Overflow from the concrete lined pits was drained into an earthen pit. Excess water from the process was sprayed on the storage yard to control dust or was discharged into the drainage ditches. A spray evaporation system was used in later years of the operation to meet State Water Control Board requirements.

EPA detected soil, sediment, ground water, and surface water contamination of the site and the adjoining property during the Remedial Investigation (RI). The contamination consists of the by-products of creosote: polynuclear aromatic hydrocarbons (PNAs), benzene, and dense non-aqueous phase liquids (DNAPL). The contamination resulted from facility operations, spills, waste streams entering drainage ditches, and on-site disposal of waste products. As of 1988, sixty-three homes were located within a 4,000-foot radius of the site, and 1,500 people lived within one mile of the site. The shallow contaminated aquifer underlying the site has only limited use at the present time as a source of drinking water but has the potential for wider use in the future, due to increased development in the area. Also, the shallow aquifer discharges to Massaponax Creek.

The site is divided into five operable units (OUs). The Remedial Investigation/Feasibility Study (RI/FS) for OU-1 through OU-4 was completed in March of 1988, and the Record of Decision (ROD) was signed on March 31, 1988. In July 1989, a Consent Decree was signed between EPA and the RF&P. In September 1995, RF&P signed an Administration Order on Consent to

complete the ground water investigation, propose cleanup plans, and design and implement the selected action to contain the plume of contaminated ground water at the site.

OU-1 covered the site security and fencing around the site. The remedial design took place in February and March 1989. Remedial action began in September 1989 and was completed in September 1993.

OU-2 covered site decontamination, demolition, removal of the process buildings, removal of railroad ties, removal of scrap metal, drums, and the on-site lagoon. Remedial design started in September 1989. Remedial action commenced in August 1990 and was completed in May 1997, when the lagoon removal was complete. This included removal and off-site disposal of wastewater, emulsion and sludge, liner material, and contaminated soil from underneath the impoundment liner.

OU-3 encompassed site water control and treatment of water in ditches on site. Much effort in this phase was spent trying to control beaver action on site. Remedial design started in March 1990 and was completed in December 1992. Remedial action began in December 1992 and was completed in February 1993.

OU-4 encompasses remediation of shallow soils and sediments on site (less than 1.5 feet in depth). Remedial design was started in March 1990 and completed in September 2000. Remedial action began in July 2001. By fall 2001 sediments were removed from the drainage ditches and wetland areas beside Massaponax Creek.

OU-5 covers the contaminated ground water and Dense Non-Aqueous Phase Liquids (DNAPLs) present on site. The RIFS began in September 1989 and is currently ongoing in the investigation phase. This work will be completed as a non-time critical removal. Activities at the site designed to evaluate the nature and extent of ground water contamination have included the installation of additional monitoring wells and periodic sampling of ground water data that will be used to evaluate potential remedial alternatives for the site.

### **Threats and Contaminants**

The shallow aquifer underlying the site is contaminated with creosote derivatives from former site activities. Sediments, soils, and surface waters may still be contaminated with creosote compounds and by-products, including polynuclear aromatics (PNAs) and benzene. Potential health risks may exist via inhalation of contaminated vapors or dust, or accidental ingestion or direct contact with contaminated soil, sediments, or surface waters. Ecological risks may exist that could also pose additional human risks if contaminated fish and waterfowl are consumed.

### **Current Site Status**

Ground water monitoring is being conducted to determine if further action is required at the site.

## Community Relations and Concerns

A site tour and meeting were conducted on September 13, 1990. In January 1991, a meeting was held to obtain information to update the existing Community Relations Plan. On April 25, 1991, an information session was held for the public. EPA issued two press releases in April 1992 on the lagoon issue.

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# Rentokil (Virginia Wood Preserving)

Henrico County, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Former Wood Preserver

**Contaminants:** Creosote and Components, Copper, Chromium, Arsenic, Xylene, Pentachlorophenol (PCP), Dioxin

**Funding:** Enforcement financed

## Site Description and History

The Rentokil site is on approximately 10 acres in Henrico County, Virginia. The facility was used for wood preserving operations between 1957 and 1990. During this period, different wood preserving chemicals were used including creosote, copper chromated arsenate (CCA), and PCP. As a result, soil, ground water, surface water and sediment were contaminated. Some existing and past sources that had the potential to contribute constituents to the environment include a blowdown sump, a drip pad, a formerly covered holding lagoon, an underground drain pipe, a "CCA disposal area", and a fill area.

The site was listed on the National Priorities List (NPL) in March 1989. Operations stopped in January 1990, all equipment was removed from the site and the area covered with clean gravel.

The Remedial Investigation/Feasibility Study (RI/FS) was completed in January 1993. During phase II of the RI, sampling indicated levels of arsenic in portions of the creek exceeded the allowable limit for aquatic life.

Rentokil and EPA signed an Administrative Order by Consent in March 1992, and Virginia Properties (owner of the site) implemented interim storm water control measures to reduce the sediment and arsenic contamination entering North Run Creek. Subsequent sampling of surface water and sediment in portions of North Run Creek showed a significant decrease in arsenic and chromium levels in both surface water and sediment. Virginia Properties has maintained site security, including fences and signs.

The Record of Decision (ROD) was completed in June 1993. The ROD called for:

- demolition, decontamination, and off-site disposal of existing structures
- excavation and off-site incineration of K001 waste from the unlined pond
- extraction and on-site carbon adsorption treatment of surface water from the unlined pond

- excavation and low temperature thermal desorption of the dense non-aqueous phase liquid (DNAPL) soils (within 25 feet of the concrete drip pad, unlined pond and former blowdown sump), and fixation treatment and on-site disposal of the CCA disposal area and the fill area soils
- off-site disposal of drums excavated from fill area
- construction of a Resource Conservation and Recovery Act (RCRA), Subtitle C cap over surface soils exceeding cleanup levels
- installation of a slurry wall
- excavation and on-site disposal of contaminated surface soil beyond the extent of the cap
- construction of a dewatering system within the cap/slurry wall, and on-site carbon adsorption treatment of ground water
- excavation and on-site disposal of contaminated sediments in the Oxbow of North Run Creek
- sampling of Talley's Pond sediments and previously dredged sediments, with excavation, treatment and off-site disposal if sediments exceed cleanup levels
- long-term ground water monitoring
- institutional controls to prevent residential use of the site and the ground water

A Consent Decree between EPA and Virginia Wood Preserving became effective in September 1994. The Remedial Design Work Plan was approved in September 1994. In March 1995, the site owner sent a letter to EPA stating that they could not carry out the selected remedial design because of Applicable or Relevant and Appropriate Requirements (ARARs) compliance issues. Also, the site owner performed a Value Engineering Analysis that showed the treatment of the soil before capping did not improve the remedy. To resolve these issues, the ROD was amended in August 1996 to delete the excavation, low temperature thermal desorption, and on-site disposal of the DNAPL soils.

The final remedial design documents were submitted in September 1997 to reflect these changes and to accommodate the Potentially Responsible Party's (PRP's) desire to develop the site for light industry. VDEQ and EPA provided comments to the PRP in December 1997.

The Remedial Action Work Plan was approved in May 1998. The remedial action construction was completed and a final remedial construction inspection was held on September 9, 1999. In the winter of 1999/2000, site drainage was changed to reduce the amount of water collecting in wetland C.

### **Threats and Contaminants**

The ground water, soil, sediment and surface water are contaminated with PCP, creosote, copper, chromium, arsenic and dioxin from former wood preserving operations. Risks exist if individuals accidentally ingest or come in direct contact with contaminated ground water, surface water, or soil. Contaminated surface water could affect nearby livestock or crops if it is used for watering or irrigation. Site runoff entering nearby wetlands may adversely affect them.

In 1987, area residents were hooked up to county water, free of charge. Homes located to the north and east of the site are on the municipal water supply.

## Current Site Status

The ground water collection system will continue to operate as long as required, and site monitoring continues.

## Community Relations and Concerns

A public meeting was held on January 20, 1993, to present the Proposed Plan. A public notice was placed in the newspaper announcing the ROD and a notice was sent to citizens. There was also a press release to local media announcing the Consent Decree. A public meeting was held on May 14, 1996, to present the proposed changes to the ROD, and a public meeting was held on May 12, 1998, to present the remedial design.

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# Rhinehart Tire Fire Dump

Winchester, Frederick County, Virginia

Superfund Program Site Fact Sheet

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**Type of Facility:** Tire Disposal Facility

**Contaminants:** Arsenic, Cadmium, Lead, Zinc, Nickel, Manganese, Polycyclic Aromatic Hydrocarbons (PAHs), Volatile Organic Compounds (VOCs)

**Funding:** Fund financed

## Site Description and History

The Rhinehart Tire Fire Dump is located in an agricultural area on the outskirts of Winchester, Virginia. The privately owned site was used from 1972 to 1983 as a tire disposal facility. On October 31, 1983, a fire broke out in the 4.5-acre area and approximately 5 to 7 million tires were eventually engulfed in the fire. The fire produced a hot oil stream from the incomplete combustion of the rubber. The smoke plume spread a 50-mile trail across four states and hot oil flowed from Massey Run to Hogue Creek to the Potomac River. An Environmental Protection Agency (EPA) emergency team controlled the fire within a few days, but the tires continued to smolder for six months.

A pond, known as Dutchman's Pond, was constructed to collect the hot oil. Approximately 800,000 gallons of oil product were collected from the pond, removed from the site, and recycled into fuel oils. The migrating oil and fire fighting residues contaminated the site and local waters. Under a consent order with EPA, the owner constructed dikes and ditches for drainage control, and performed collection and pumping operations to minimize waste escaping from the site. The owner also undertook extensive excavation and regrading activities, and restricted access to the site.

The site was divided into three operable units (OUs) to facilitate the remedial work.

**OU-1** was a long-term phase of treating ground and surface waters. After the site was listed on the National Priorities List (NPL) on June 1, 1986, the U.S. Army Corps of Engineers performed a two-phased Remedial Investigation/ Feasibility Study (RI/FS). In June 1988, a Record of Decision (ROD) for operable unit one (OU-1) was signed to address surface water. The remedies included: instituting soil erosion controls; raising the existing dam on the unlined pond by 13 feet; collecting and treating surface water runoff with gravity settling; collecting shallow ground water oily seeps; and separating water from oil and transporting it to a wastewater treatment plant.

The remedial design was completed in July 1989 and the remedial action was initiated in September 1989. A portable water treatment facility was set up on the site and a dam constructed to form Rhinehart Pond. The plant met effluent discharge requirements and maintained proper water levels in Rhinehart Pond. The plant operated from March until December, and Rhinehart Pond stored the water until operations resumed in March of the following year. The treatment plant and dam were removed in the summer of 2002 as part of the site close out.

**OU-2** consisted of removal of Dutchman's Pond. The ROD was signed on September 29, 1992, with the remedial action commencing on August 26, 1994. Remedial action was completed on February 15, 1995. EPA constructed this pond under emergency conditions to prevent the burning oil formed by pyrolysis from leaving the site via the adjacent stream. The pond is now gone and the area has been reseeded and stabilized.

**OU-3** was a site-wide environmental assessment of the area affected by the fire and the object of the remedial efforts. The RI/FS for OU-3 began in the spring of 1996, and consisted of an evaluation of the soils, the sediments, and the ground water. The ROD was signed in September of 2000. The remedial design was started in January 2001 and completed in December 2001. The remedial action was completed in August 2002, and consisted of slope regrade, dam and pond sediment removal, stream reshaping and sediment removal, water treatment plant removal and site revegetation.

### **Threats and Contaminants**

On-site ground water was contaminated with slightly elevated levels of heavy metals including arsenic, cadmium, and lead, as well as volatile organic compounds (VOCs), including toluene and xylene. Sediments were contaminated with oils and residues from the tire fire, in addition to heavy metals such as arsenic, cadmium, lead, and nickel. The soil was contaminated with metals and low levels of polycyclic aromatic hydrocarbons (PAHs) from tire burning. Massey Run and other surface waters were contaminated with various heavy metals and VOCs.

### **Current Site Status**

EPA and VDEQ conducted a second five-year review of the site in September 2002. The site should proceed toward delisting from the NPL.

### **Community Relations and Concerns**

The level of community concern was minimal prior to the fire and very high during the fire and removal action. Concerns have greatly subsided since 1984.

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# Saltville Waste Disposal Ponds

Smyth County, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Former Chlor-alkali Plant

**Contaminants:** Mercury

**Funding:** Enforcement Financed

## Site Description and History

The Saltville Waste Disposal Ponds site is located along the North Fork of the Holston River (NFHR) between the Town of Saltville and the community of Allison Gap in western Smyth County and eastern Washington County, Virginia. From 1895 to 1972 Olin Chemical Corporation (Olin) and its predecessor used the site for various chemical operations. These operations released industrial wastewater containing mercury into two large adjacent wastewater treatment ponds, known as Ponds 5 and 6, resulting in mercury contamination of the site and the NFHR.

In August 1982, the Virginia State Water Control Board issued a Consent Special Order to Olin under which Olin dredged 1000 feet of the NFHR. Olin placed the dredged material in a landfill created at the site of the former Chlorine Plant. Olin also constructed a surface water diversion ditch on the western side of Pond 5. The site was placed on the National Priorities List (NPL) on September 1, 1983. An Environmental Protection Agency (EPA) removal action, consisting of contaminated soil removal, took place in October 1991 in an area proposed for a bridge construction.

The site is being addressed in three operable units (OUs) to facilitate the work. OU-1 covered the construction of a surface water diversion ditch around the eastern side of Pond 5 and a treatment plant to handle surface water collected at Pond 5. OU-2 includes remediation of Ponds 5 and 6 and ground water interception. OU-3 involves investigations of the river and the former Chlorine Plant area, and any necessary remedial action. (EPA splits OU-1 and uses four OUs for the site.)

A Record of Decision (ROD) for OU-1 was signed in June 1987. The remedy selected was: treatment of contaminated water from Pond 5 using pH adjustment, filtration, and carbon absorption; installation of a ground water monitoring system; and the design and construction of a diversion ditch to prevent surface water run-on to the eastern side of Pond 5.

At OU-1, the up gradient control (Pond 5 Eastern Diversion Ditch) was completed in 1991 and the water treatment plant went on line in November 1994. The discharge limits were modified in September 2000 due to changes in the mercury standards. In early 1997, the pumps at the water treatment plant were upgraded to handle increase water volumes following heavy rainfall.

In September 1995, a ROD for OU-2 was signed. The remedy selected was: installation of a cap and a ground water interception system, and revision of discharge limits at Pond 5; installation of a soil cover, and pH adjustment of surface water collected from Pond 6 and discharged to the river.

In April 1997, Olin signed a consent decree and an administrative order. The remedial alternatives for Pond 5 and 6 consist of capping, ground water interceptor trenches, ground water treatment, and institutional controls. Olin hired LAW Engineering and Environmental Services to do the remedial design work.

They conducted field activities to delineate the extent of mercury present and physical characteristics of the Pond 5 and 6 sediment. The Remedial Design Report was completed in March 2001, and the remedial action was completed in September 2002. It consisted of capping Pond 5, covering Pond 6, piping the Pond 6 outfall to the water treatment plant, and improving the ground water interception swales.

OU-3 activities include an investigation of the former Chlorine Plant site, an investigation of surface water, sediments, fish and invertebrates in the NFHR and the main stem of the Holston River, and any required remedial action. Approximately 1,140 people live within a mile of the site. The community's drinking water is obtained from uncontaminated surface springs.

### **Threats and Contaminants**

Mercury from the plant's waste disposal ponds has contaminated soils, ground water, sediment, and surface water. Eating contaminated fish from the NFHR poses a health risk. The NFHR is a habitat for two endangered species: the fine-rayed mussel and the spotfin chub. Virginia and Tennessee have placed modified bans on fishing in the NFHR. Virginia allows catch-and-release game fishing, while Tennessee allows catch-and-release and trophy fishing. Eating fish from the regulated section of the NFHR is prohibited. A preliminary ecological assessment shows there may be a threat to aquatic or terrestrial receptors.

### **Current Site Status**

The OU-1 water treatment plant will continue to operate as long as it is needed, and maintenance of the surface water interception ditches will continue.

Maintenance of the OU-2 Pond 5 cap, the Pond 6 cover and the ground water interception swales will continue.

OU-3 is in the Remedial Investigation/Feasibility Study (RI/FS) stage. A work plan done by Golder Associates for supplemental site characterization studies for the former chlorine plant site

was approved in September 1997. Completion of the supplemental work to evaluate the effectiveness of the soil cover was completed in early 1998, and ground water monitoring was completed later in 1999. A revised Supplemental Remedial Investigation Report was submitted in September 2002.

A Supplemental Remedial Investigation Work Plan on the NFHR was submitted in April 1993 and approved in April 2002. The Holston River Sediment Investigation Work Plan was submitted in March 2002. Olin continues to do routine river monitoring.

In October 2000 Tetrtech started work on the ecological risk assessment of the NFHR. Ecological sampling began in August 2001 and continued into 2002. The NFHR Screening Level Ecological Risk Assessment was submitted in August 2002.

A Five-Year Review Report was completed in September 2002 for the entire site.

### **Community Relations and Concerns**

On July 18, 1990, a press conference, legislative briefing, and public meeting were held. Community interviews took place in June 1991 and public availability sessions were held for the community on July 27 and 28, 1994. Also, a public meeting was held on February 1, 1995, to present the proposed remedial design plan for OU-2. Additional public availability sessions were held on March 8 and 9, 1995. A public availability session for the remedial action plan was held on April 16, 2001.

An OU-3 Proposed Plan public meeting will be held when the RI/FS is complete. Olin sponsors a community liaison panel that publishes a newsletter.

The citizens were concerned about the total effect from all potentially contaminated sites so the Agency for Toxic Substances Disease Registry (ATSDR) conducted an area health consultation. In May 1997, they concluded that the site could not be linked to area health concerns. ATSDR has also managed community relation activities.

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# Saunders Supply Company

Suffolk, Virginia

Superfund Program Site Fact Sheet

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<b>Type of Facility:</b>	Former Wood Preserver
<b>Contaminants:</b>	Pentachlorophenol (PCP), Copper, Chromium, Arsenic, and Dioxins/Furans
<b>Funding:</b>	Fund Financed

## Site Description and History

The Saunders Supply Company Superfund site is on a 7.3-acre tract, in a mixed residential and commercial area, in the Chuckatuck area of the City of Suffolk, Virginia. The company used a 5-percent PCP in a No. 2 fuel oil base for wood preserving operations between 1964 and 1984. In 1974, a new process, using copper chromated arsenate (CCA) solution, was introduced.

The wastewater from a water/oil separator was discharged into a wastewater pond and was, then, periodically discharged to a nearby stream. The stream is on the western boundary of the facility, and flows into Godwins Millpond Reservoir, one of Suffolk's drinking water supplies. From 1966 to 1981, PCP sludge, collected from the water/oil separator, was either burned or sprayed on roads for weed control.

Site investigations began in 1981 when the State Water Control Board and the Virginia Department of Health investigated an alleged PCP-like sludge near the site. In March 1984, contaminated soil within a 30-foot diameter of the former conical burner was excavated to a depth of eight feet and placed in a landfill. A recovery well was installed and the well water was used as CCA process water.

The site was proposed to the National Priorities List in January 1987 and was officially listed in October 1989. Initially, Saunders sought to undertake the Remedial Investigation/Feasibility Study (RI/FS). However, due to financial inability, the Environmental Protection Agency (EPA) transferred the site to a fund-lead and contracted the Ecology and Environment to prepare the RI/FS. The RI/FS was completed in May 1991 and the Record of Decision (ROD) was signed in September 1991.

The selected remedy included:

- excavation, dechlorination treatment, and off-site disposal of the K001 sediments from the wastewater pond and the former earthen separation pond

- excavation, low temperature thermal desorption treatment, and off-site disposal of the site soils and the sediments from the storm sewer
- treatment of the ground water during the dewatering process before excavating the soil
- scarification of concrete pads
- cleaning and slip-lining the storm sewer

Due to changes in regulations, additional site data, and additional treatment options, the ROD was amended in September 1996. The new remedy called for off-site incineration and disposal of the site soils and storm sewer sediments. Also, the ground water collection and treatment system to be constructed under EPA removal authority was to be operated and maintained.



*Saunders Supply Co.  
Photo by Tom Modena*

EPA contracted with Ecology and Environment to develop the Remedial Design Work Plan (RDWP). The RDWP was completed in July 1993 and the Final Design Report was issued in September 1996. During routine design-phase ground water sampling, EPA discovered the Pentachlorophenol contamination in the ground water had begun migrating off site toward Godwins millpond Reservoir. EPA evaluated the extent of the ground water plume and the hydrogeology. Construction started in January 1998 on the ground water collection and treatment system and it began operation in April 1998. The remaining remedial work was initiated in March 1999 and the final construction completion inspection was held on November 9, 1999.

## Threats and Contaminants

The ground water is still contaminated with arsenic, chromium, and PCP from wood treating process wastes. The natural ground water flow is toward the reservoir, a primary drinking water source, and a freshwater wetland. They would be threatened by site contamination if the ground water collection and treatment system stopped operating.

## Current Site Status

The U.S. Army Corps of Engineers (USACE) redesigned the surface water drainage to resolve problems in the front and middle portions of the site. Construction took place in the spring and summer of 2001. This improved the drainage problems at the site. They are also designing a water treatment plant for the adjoining landowner.

The ground water treatment plant will continue to operate as long as it is needed.

## Community Relations and Concerns

A public meeting was held on April 3, 1989, to discuss the work plan for the RI/FS. EPA drafted the Community Relations Plan in May 1991, and the Proposed Plan meeting was held on June 4, 1991. On August 20, 1996, a second Proposed Plan meeting was held to present the revised site remedy. A meeting was also held on September 23, 1998 to present the remedial design and details of the soil and sediment activities.

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# **U.S. Titanium**

## **Piney River, Nelson County, Virginia**

### **Superfund Program Site Fact Sheet**

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**Type of Facility:** Former Titanium Dioxide Manufacturing Plant

**Contaminants:** Iron Sulfate Acidic Discharge to Surface Water and Ground water

**Funding:** Enforcement Financed

#### **Site Description and History**

The U.S. Titanium is a 50-acre Superfund site on the north side of the Piney River in Nelson County, Virginia. The site was a titanium dioxide manufacturing plant. The Virginia Chemical Corporation and the American Cyanamid Company produced titanium dioxide at the site between 1931 and 1971 by acidifying ilmenite, an ore containing iron and titanium. A by-product of this process is copperas (ferrous sulfate) which was piled along a hillside at the site. Many fish kills occurred in the Piney River from 1977 to 1981 because of acidic run off from copperas and acidic leachate. In 1980, copperas was removed from the hillside and buried on site. Site concerns included degradation of the Piney River water quality, vegetation destruction by acidic leachate, and ground water contamination.

The site was placed on the National Priorities List (NPL) on September 1, 1983, and the Record of Decision (ROD) was signed in November 1989. Cytec, formerly American Cyanamid Company, the principal responsible party, entered a Consent Decree for the Remedial Design and Remedial Action (RD/RA) in September 1990.

Seven areas were identified for treatment in the remedial investigation. These areas include: Area 1 copperas burial pit; Area 2 copperas piles; Area 3 former evaporation pond; Area 4 unreacted ore waste pile; Area 5 sedimentation ponds; Area 6 settling pond; and Area 7 surface water runoff.

RD was carried out from 1991 to 1994, and RA construction was started in September 1994 and completed in May 1997. The ferrous sulfate in Area 1 was excavated, neutralized, and deposited in Area 3. Drainage controls, stabilization, and revegetation were implemented in Areas 1-5. Acidified soil and sediment in Areas 2 and 7 were neutralized with lime. Area 6 required no action. A treatment system was constructed to collect and treat iron-bearing acidic ground water. French drains carry the water to a pump station, and the water is then pumped to a treatment plant for neutralization, settling, and discharge to the Piney River. Other remedial features included monitoring, road maintenance, and deed and access restrictions. These strategies are

deemed effective for reducing acidic and iron discharges, and inert material runoff to acceptable standards.



### **Threats and Contaminants**

The ground water is contaminated with iron sulfate and is highly acidic because of former plant operations and the 1980 copperas burial. Acidity and elevated metal concentrations were found in both on-site seeps and off-site surface water. Ingestion or direct contact with contaminated ground water poses only a slight threat, since no off-site well contamination has been detected and municipal wells are up gradient from the site.

The acidity of the water and the waste seeps could be harmful and they could increase the solubility of metals that enters the water. The remedial construction has now intercepted the seeps and the acidic runoff to the Piney River. The periodic runoff of inert material that coated the bottom of the Piney River and decreased productivity of the river has also stopped due to the site stabilization work.

### **Current Site Status**

The ground water treatment plant will continue to operate as long as the ground water collected remains acidic. Also, quarterly treatment plant effluent sampling will continue. A five-year review of the site was conducted in April 1999.

The voluntary Remediation Enhancement Study was approved in June 2002 to study if the ground water remediation can be accelerated. Also, the Railroad Right-of-Way Evaluation for pH, Iron and Acidity was conducted in 2002 and surface soils in ditches along the right-of-way will be remediated in 2003 based on that study. Finally, an ESD was issued in September 2002 to document changes to the site remediation and address long-term institutional control issues. The Consent Decree will be revised in the near future to also document these changes.

### **Community Relations and Concerns**

The Community Relations Plan was drafted in May 1989 and updated to include RD/RA in December 1991. A meeting was held in October 1991 to discuss the RD Work Plan. A media tour was held for a local television station in November 1992. A meeting was held on August 19, 1994, to discuss the final RD and schedule for cleanup. A media tour of the site was held on the same day. In October 1994, the Virginia Department of Environmental Quality (VDEQ) and the Environmental Protection Agency (EPA) also held a media tour on the site to show the RA work and answer questions from the press. About seven reporters attended. On September 24, 1997, another media event was held at the site to publicize the completion of the remedial construction.

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## **Section Two -- Private NPL Sites, Delisted**



# Dixie Caverns County Landfill

Roanoke County, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Disposal Site for Municipal Refuse, Solvents, and Fly Ash

**Contaminants:** Lead, Cadmium, Zinc, Silver, Iron, Benzene, Substituted Benzene, Chlorinated Ethane, and Polynuclear Aromatic Hydrocarbons (PAHs)

**Funding:** Enforcement Financed

## Site Description and History

Roanoke County, Virginia operated Dixie Caverns County Landfill as a disposal site for municipal refuse, solvents, and fly ash from 1965 to 1976. From 1967 to 1975, electric arc furnace air emission control dust from the Roanoke Electric Steel Corporation was taken to the site and disposed in a fly ash pile. When the landfill was closed in 1976, it was not capped. An intermittent stream on the site flowed through a large drum pile and the fly ash pile, and emptied into the Roanoke River approximately two miles southeast of the landfill. There was also a sludge disposal pit on site.

In the fall of 1987, the County of Roanoke entered a Consent Agreement and Order with the Environmental Protection Agency (EPA) that required the county to clean the site. The site was placed on the National Priorities List (NPL) in October 1989. Negotiations for the Remedial Design/Remedial Action (RD/RA) Consent Decree concluded in June 1993. The County of Roanoke and Roanoke Electric Steel Corporation agreed to clean up the fly ash pile, reimburse EPA more than \$1.27 million in past response costs, and pay all future costs associated with the cleanup.

There were four areas of the site that required remediation: the drum disposal area, the solvent contaminated sludge pit, the fly ash disposal area (ash from the electric arc furnace), and the stream area. A removal action was performed in 1988 to dispose of drums and contaminated sludge from the sludge pit.

The Operable Unit 1 (OU-1) Record of Decision (ROD) addressing the fly ash was signed in September 1991. High temperature metals recovery of lead and zinc was the chosen remedy. Remedial action began in August 1994 and was completed in August 1995. On August 30, 1995, EPA and the State conducted a final inspection of the removal and OU-1 remedial actions. There was no operation and maintenance phase for this OU.

OU-2 covered the remainder of the site. After a Removal Order addressing stream sediments was signed in August 1992, EPA issued a no further action ROD for OU-2, based on the rationale that all risks posed by the remainder of the site had been or were to be addressed under prior and current remedial and removal actions. The removal action to extract ash sediment from the stream and encapsulate it on site began in 1995, and was completed in 1997. Stream restoration completed in the summer of 1997 was the last major remedial activity on the site. Monitoring well abandonment, detention pond clean out, and landfill capping were completed by the fall of 1997. The first Five Year Review for the site was completed in the summer of 2001.

### **Threats and Contaminants**

The on-site sludge pit soil was contaminated primarily with aromatic and polycyclic aromatic hydrocarbons (PAHs). Also, the drum disposal area was contaminated with organic chemicals. In addition, runoff water from the fly ash pile contaminated stream sediments immediately downstream of the site with ash and metals. Prior to the cleanup completed in 1997, conditions at the site were a threat to surface waters in the area; however, residential wells that were tested did not show site contamination.

### **Current Site Status**

The site was delisted from the National Priorities List in September 2001. The next Five Year Review will be completed in 2006 to ensure that the remedy is protective and functioning properly.

### **Community Relations and Concerns**

An estimated 1,990 people live within 3 miles of the site and are served by private water supply wells. The closest home is 1/2 mile south of the site. The Dixie Caverns, a local tourist attraction, is a mile downstream of the site.

EPA scheduled a final on-site public review of the remediated site for the fall of 1997. The intent of the meeting was to show the completed work and answer questions and concerns. When the Potentially Responsible Parties (PRP) (Roanoke Steel Company and Roanoke County) declined to participate in the public meeting, EPA canceled the function.

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# Matthews Electroplating

Roanoke County, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Former Electroplating and Bumper Repair

**Contaminants:** Chromium, Nickel, and Cadmium

**Funding:** Fund Financed

## Site Description and History

Matthews Electroplating is in Roanoke County, two miles southwest of Salem, Virginia. Bumper repair and plating was done at the site from 1972 until the owner went bankrupt in 1977. Electroplating waste was discharged directly on the ground and drained into a nearby sinkhole. Between 1975 and 1982, the Virginia State Water Control Board (SWCB) found contamination from metals (chromium, nickel, cyanide and other pollutants) in some residential water supply wells just west (down gradient) of the site.

In 1977, the SWCB ordered the new buyer of the site to install a clay cap and to construct surface water diversion ditches at the site. The site was proposed for the National Priorities List (NPL) in October 1981 and listed in September 1983.

A Remedial Investigation/Feasibility Study (RI/FS) was conducted in 1982 and 1983. The preferred cleanup option recommended by the study and selected by the Environmental Protection Agency (EPA) and the State, was to provide an alternate source of potable water to the affected homes. Water was supplied by a water main extended from the nearby Salem Water Treatment Plant. In 1987, an EPA contractor sampled the home wells, and collected and analyzed soil samples from the site. The results showed no further cleanup action was needed.

Based on the results of the 1987 investigations, EPA proposed, and the State concurred, to delete the Matthews site from the NPL. EPA and the State determined that the Matthews site no longer posed a significant threat to human health or the environment, and no further action under Superfund was needed. The site was formally deleted from the NPL in January 1989.

The Virginia Department of Environmental Quality (VDEQ) monitored the site for three years after NPL deletion, during the operations and maintenance phase. The purpose of long-term monitoring was to monitor the continued success of the remediation. EPA and the State of Virginia completed the close out report in 1993, which relieved the state from future obligations at the site.

## Threats and Contaminants

Ground water was contaminated with chromium residues from the former electroplating operations. Soil was contaminated with chromium, nickel, and cadmium. Those who accidentally ingested or came in direct contact with the contaminated ground water or soils were at risk.

## Current Status

The EPA conducted a five-year review of the site in April 1999. Because the county changed the zoning for the site from industrial to residential, EPA conducted soil sampling in September 1999 to ensure that the remedy is still protective. EPA determined that the remedy was protective for residential use of the property, and VDEQ concurred.

## Community Relations

Throughout the project, EPA and the State maintained a community relations program that included meetings with local officials, press conferences, public consultations, fact sheets, and interim reports on the status of the project. The local citizens exhibited an active interest in having their concerns heard.

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# Suffolk City Landfill

Suffolk, Virginia

Superfund Program Site Fact Sheet

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<b>Type of Facility:</b>	Solid Waste Landfill
<b>Contaminants:</b>	Arsenic and Chromium
<b>Funding:</b>	Enforcement funded

## Site Description and History

The Suffolk City Landfill (Hosier Road Landfill) is a 67-acre parcel east of Hosier Road in the City of Suffolk, Virginia. The City of Suffolk operated the landfill from approximately 1967 to January 1985 as a sanitary landfill by Permit No. 310 issued by the Virginia Department of Health. Municipal wastes were disposed in the unlined landfill and advanced the final grade to approximately 20 to 30 feet above the undisturbed ground level.

Current surface water features at the landfill include drainage ditches, a detention pond, and a retention basin. Water flows intermittently from the detention pond into an unnamed stream found north of the landfill. This stream is joined by another unnamed stream, found east of the landfill.

The landfill permit was reissued in June 1983. Pursuant to the reissued permit, the city was required to close the landfill when the regional landfill became operational. While preparing for the closure plan, the city discovered documentation showing that "several tons" of pesticides had been disposed in the landfill in 1970. The disposed pesticides damaged by a fire at the Dixie Guano Company, included Disyston, Cu7 Sulfure, 7 Sulfure, Thimet, and Cyanox. Available information does not show consistent design and dimensions of the pesticide disposal pit. Most of the pesticides were treated with lime to promote hydrolysis processes that break down the pesticides. Currently, an impervious plastic layer covers the pesticide disposal area. The cover measures approximately 100 feet by 36 feet. In 1988, the city covered, graded, and replanted the landfill.

The site was proposed to the National Priorities List (NPL) in June 1988, placed on the list in February 1990, and deleted in January 1995. In June 1989, the city signed an Administrative Order on Consent (AOC) with the Virginia Department of Environmental Quality (VDEQ). The AOC required the city to implement a Remedial Investigation/Feasibility Study (RI/FS) and a Temporary Leachate Collection Plan (TLCP) to prevent further migration of the leachate from the site. The TLCP was implemented and operated by the city's Department of Public Works. The RI/FS lasted from April 1991 through September 1992. The RI revealed low-level ground

water contamination involving arsenic and chromium in an area found immediately down gradient of the site. The study did not detect any pesticide contamination. Scientific information on pesticides shows these substances are prone to degrading naturally over time.

### **Threats and Contaminants**

The ground water was contaminated with low levels of arsenic and chromium. Potential health hazards included ingestion or direct contact with contaminated ground water underneath the site.

### **Current Site Status**

The Record of Decision (ROD) was signed in September 1992. Based on the findings of the RI, it was concluded there is no significant contamination migration occurring at the site, therefore, the no-action alternative was selected. The ROD also requires yearly ground water monitoring to ensure continued protection of human health and the environment. The Environmental Protection Agency (EPA) deleted this site from the NPL on January 24, 1995. A five-year review was performed on the site in August 1999.

### **Community Relations**

The Community Relations Plan was drafted in 1989 and updated in 1991. Community Workshops were held throughout the RI/FS period, and citizens expressed interest in learning more about Technical Assistance Grants (TAGs). Although a TAG workshop meeting was held, a TAG application was not submitted. On September 3, 1992, a public meeting was held to present the Proposed Plan and answer questions from community members.

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## **Section Three -- Federal Facilities**



# Defense Logistics Agency

Chesterfield, Virginia

Superfund Program Site Fact Sheet

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**Type of Facility:** Federal Supply Facility

**Funding:** Department of Defense  
Defense State Memorandum of Agreement

**Lead Agency:** Defense Logistics Agency

## Site Description and History

Defense Supply Center Richmond (DSCR) is an active federal facility located on 640 acres, approximately two miles south of Richmond. DSCR manages and furnishes over 300,000 different supply items to the Armed Forces and several federal civilian agencies. It is part of the Defense Logistics Agency.

The installation was listed on the National Priorities List (NPL) on July 1, 1987. DSCR is participating in the Installation Restoration Program, a Department of Defense (DOD)-funded program for remediating hazardous waste sites at DOD facilities similar to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Under this program and the corrective action section of the facility's Resource Conservation and Recovery Act (RCRA) permit, DSCR is currently conducting Remedial Investigations (RIs) at this facility. An Interagency Agreement was signed involving DSCR, the State, and the Environmental Protection Agency, which named DLA as the lead agency for the site.

RIs at the site have been divided into three areas: Area A (a former Landfill, Area 50, and the Open Storage Area); Area B (the former Fire Training Pits #1 and #2); Area C (the Acid Neutralization Unit). These investigations have resulted in the facility being divided into 13 distinct Operable Units (OUs):

**OU-1 Open Storage Area:** This site consists of a 43-acre fenced area, primarily used to store petroleum products. Elevated levels of arsenic and antimony were detected in soil samples. However, studies show the site poses little risk. In 1992, an institutional control's Record of Decision (ROD) for soils was signed for this area and is presently in effect. The site has undergone a 5-year review.

**OU-2 Area 50 (Former Landfill):** This site is approximately 13 acres in size. The site formerly contained a ravine, but landfill activities conducted from 1955 to the early 1970's have transformed the site into a level field. Fill material is believed to consist of miscellaneous trash and debris from facility operations. Constituents of concern in this waste include photographic

process wastes, solvents, pesticides, herbicides, petroleum products, PCBs and other unidentified chemicals. A few small unexploded ordnance items have been found in the landfill during previous investigations. In May 2000, the DLA proposed a remedial action plan for the site that called for capping the entire site, establishing institutional controls to control future activities at the site and a long term groundwater monitoring plan. Public review of the proposed plan has questioned the need for the clay cap. Because much of the OU-2 fill is within the groundwater table, storm water infiltration is now thought to be a minor factor in contaminant migration. Consequently DLA is reexamining its proposed plan for OU-2. Landfill closure requirements are under review by the Virginia Department of Environmental Quality.

**OU-3 National Guard Area (NGA):** The NGA is a 15-acre site located on the east-central boundary of DSCR. The Virginia Army National Guard has leased it since the 1950s. Currently, the site is used for vehicle maintenance. A ROD was signed in September 1995 that calls for institutional controls along with the removal of approximately 100 cubic yards of contaminated soil. The soil was removed in August 1996. This site is undergoing a 5-year review.

**OU-4 Fire Training Source Area:** Consists of three fire training pits that were used from the early 1960's to the late 1970's. Extensive investigation was conducted at the pits. Based on the risk assessment a ROD was signed in July of 1999 stating that no further action is necessary at this site. However OU-13 sampling raised concerns of possible migration of corrosives.

**OU-5 Acid Neutralizing Pits:** Wastewater from metal cleaning operations and spent cleaning bath solutions were discharged into the settling tanks, neutralized, and discharged into the storm sewer. High levels of arsenic and organic contaminants were detected. The ROD was signed March 25, 1992. A Vacuum Vapor Extraction Pilot System was built and operated during the Remedial Design (RD) to gather data for the final design. During the operation of the pilot plant, the levels of contamination dropped to near nondetectable levels. As a result, 20 additional soil samples were taken in and around the tanks and no additional contamination was found. The tanks were cleaned, backfilled, and capped. This site was closed out for no further action with an Explanation of Significant Difference to the ROD.

**OU-6 Area 50 (shallow groundwater):** This OU consists of the contaminated groundwater beneath and downgradient of OUs 1, 2, and 3. The primary contaminants of concern in OU-6 are chlorinated volatile organics. An interim remedial action was taken in 1996 that consisted of the installation of a "pump and treat" system to capture the contamination plume. Currently this OU is undergoing a remedial process optimization study to determine the most appropriate final remedial alternative.

**OU-7 Fire Training Area (groundwater):** This OU consists of the contaminated groundwater beneath and downgradient of the Fire Training Area. The primary contaminants of concern in OU-7 are chlorinated volatile organics. A supplemental RI will be conducted to address data gaps for purposes of facilitating remedial decisions.

**OU-8 Acid Neutralization Pits (groundwater):** The existing dual phase extraction system has been effective in source removal/reduction of the dissolved-phase plume. A rebound test will be conducted to assess response of VOC levels with the system turned off.

**OU-9 Interim Groundwater Treatment System:** A plume of contaminated groundwater is migrating from the DSCR property. A ROD was signed on September 29, 1993, to address the contaminate plume on an interim basis until a permanent solution is determined. Construction of a pump-and-treat system was completed in October 1996 and the system is in operation. This site is undergoing a five-year review.

**OU-10 Building 68:** This OU is a former pesticide and PCB transformer storage area. The building is currently used to store scale house items and as a parking area for trucks. A potential migration pathway for the site's contaminants of concern is site runoff entering the storm water sewer system and discharging into No Name Creek. Currently this OU is undergoing a revision to its Remedial Investigation to assess these potential impacts to No Name Creek and to confirm groundwater flow direction within the OU. An EE/CA will be conducted to revise the remedy selection. This site may be capped to eliminate receptor pathways.

**OU-11 Transitory Shelter 202:** This OU is a former pesticide storage facility. Pesticide contamination of the soils is the primary remedial concern. This OU is undergoing a feasibility study to determine the most appropriate remedial alternative. However, an EE/CA will be conducted to revise the remedy selection. This site may be capped to eliminate receptor pathways.

**OU-12 Building 112:** This OU is a former pesticide shop. Pesticide contamination of the soils is the primary remedial concern. The DLA previously has proposed the excavation of contaminate soil as a remedial action for the OU. However, an EE/CA will be conducted to revise the remedy selection. This site may be capped to eliminate receptor pathways.

**OU-13 PAH Area:** This OU is a former materials storage and petroleum product storage area. The primary contaminants of concern are PAHs, metals, and PCBs in the soils. This OU is undergoing a feasibility study to determine the most appropriate remedial alternative.

## **Community Relations**

Virginia Department of Environmental Quality representatives participate on the technical review committee, attend public meetings, and conduct site visits. A Community Relations Plan was updated in November 1991. DSCR sends newsletters to citizens on the mailing list periodically.

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# Fort Eustis

## Fort Eustis, Virginia

### Superfund Program Site Fact Sheet

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**Type of Facility:** Army Federal Facility

**Funding:** Department of Defense  
Defense State Memorandum of Agreement

**Lead Agency:** Army

#### Site Description and History

The U.S. Army Transportation Center, Fort Eustis, is an 8,300-acre facility in southeastern Virginia, within the City of Newport News. Fort Eustis is the Transportation Corps Training Center, providing training in rail, marine, and amphibian operations and other modes of transportation. Fort Eustis began operations in 1918 as a training camp and became a permanent installation in 1923. Approximately 17,500 military personnel and civilians work, live, or train at Fort Eustis.

The installation has 26 Installation Restoration Program (IRP) sites. Ten of these sites are closed and considered No Further Action sites. There are 16 active IRP sites; most are in the Remedial Investigation/Feasibility Study (RI/FS) stage. The sites include landfills, a pesticide and transformer storage area, a fire fighting training area, underground storage tanks (USTs), a pesticide storage building, and several surface water bodies:

**Site 1 - Officers Club Landfill #1:** The Officers Club Landfill #1 is in the northern section of Fort Eustis, along the Warwick River. This landfill was reported to receive miscellaneous refuse and construction debris between 1937 and 1953. The landfill is currently maintained as a recreational area.

A semi-annual sampling program is performed on four monitoring wells at this site. In recent data, beryllium and iron were detected above Maximum Contaminated Levels (MCLs). Future IRP tasks will include continued semi-annual groundwater monitoring to determine the impact of the landfill on the quality of groundwater in the uppermost aquifer underlying the landfill. The final report for the 1997 monitoring event was completed in April 1998. Long-term monitoring is no longer being conducted.

**Site 2 - Landfill #15:** Inactive Landfill #15 started receiving waste in 1972 and is divided into two adjacent fill areas. The western area ceased operation in 1980. The eastern area ceased

operation in 1988. The landfill was used for solid waste disposal, including domestic trash, garbage, sewage, sludge, grease, grit, and incinerator ash.

Quarterly sampling of the landfill showed groundwater quality has been affected based on increased levels of chloride, total dissolved solids, and sodium in wells down gradient of the landfill. The landfill, which was permitted, has since undergone closure under the Virginia Solid Waste Management Regulations. As part of the closure, approximately 23 acres were capped. Long-term monitoring of groundwater and surface water will continue to be a requirement of the closure.

In September 1995, Fort Eustis installed three gas monitoring wells, and, in October 1995, submitted a methane gas remediation plan to the Virginia Department of Environmental Quality (VDEQ) for review and approval.

The Pre-Design Investigation Report was completed in February 1997 and the contract for installation of a methane collection system has been awarded. Methane gasses are still being detected above the Lower Explosive Limit (LEL). In April 1997, four groundwater and two surface water samples were collected. No Volatile Organic Compounds (VOCs), Semi Volatile Organic Compounds (SVOCs), pesticides, Polychlorinated Biphenyls (PCBs), or explosives were detected. Barium was detected below the Maximum Contaminant Level (MCL). Barium and lead were detected in the surface water.

In September 1999, the 2-foot topsoil cap slid across the top of the drainage layer of the cap along one slope of the landfill. Heavy rain from Hurricane Floyd caused the soil to become very saturated. The synthetic liner was not damaged. The cap was repaired by December 1999. Long-term monitoring of the landfill is expected to continue until the year 2024.

**Site 4 - Landfill #7:** Landfill #7 operated from 1951 to 1972. The landfill received trash, construction debris, and miscellaneous refuse including paints, oils, pesticide and herbicide containers, and pathological wastes. Quarterly monitoring showed groundwater quality down gradient of Landfill #7 is being affected. Several metals detected exceeded the Virginia Groundwater protection standards.

The landfill has been closed and capped in the same manner as Landfill #15. Long-term monitoring will continue to assess the impact of the landfill on groundwater.

In April 1997, four groundwater and two surface water samples were collected at each of the two landfill sections. Lead was the only constituent detected above its MCL. In September 1995, Fort Eustis installed four new methane gas monitoring wells and a remediation plan is being designed. Methane gas has been detected at the landfill boundary. A Pre-Design Report has been completed and a contract for installation of a methane collection system has been awarded. Three gas extraction wells and a soil vapor extraction system were installed. Methane gas monitors with alarms were installed in the five nearby warehouses.

**Site 5 - Open Burning Incinerator:** This site was used to burn paper and cardboard waste at Fort Eustis. The ash was drummed and hauled off site by a contractor. The site is no longer



used for this purpose. A Preliminary Assessment was conducted that resulted in a determination of no further action at this site.

**Site 8 - Sewage Treatment Plant:** The sewage treatment plant at Fort Eustis has an average daily flow capacity of 1.5 million gallons per day. Wastewater effluent, which is characterized as domestic flow, is discharged to the James River. Solids generated in the treatment process consist of skimmed grease and sludge. A Preliminary Assessment was conducted resulting in a determination for no further action at this site.

**Site 9 - Building 801 Central Heat Plant:** The Central Heating fuel spill area has four 25,000-gallon underground oil tanks, which store fuel for a steam generation plant. One of the tanks previously stored waste oil generated from daily plant operations. Past information shows that petroleum was released to the soil by overfilling. An estimated 6,000 to 8,000 gallons of No. 4 fuel oil were spilled in 1984. In 1990 and 1994 additional spills occurred.

Investigations of soil, sediment, surface water, and groundwater revealed the presence of fuel-related compounds and polychlorinated biphenyls (PCBs). PCBs are present in significant concentrations in the sediment of Bailey Creek, receiving drainage from the Site 9 area. Some ecological receptors in Bailey Creek have been affected, also causing negative impact to the food chain. The final Remedial Investigation (RI) report has been completed and a plan is being prepared for the removal of the higher concentration PCB contaminated sediments from the inlet area to Bailey's Creek from site A.

This site is considered no further action. All other activities are under the Bailey Creek site.

**Site 10 - Range Impact Area:** The Range Impact Area is approximately 1,750 acres and is in the low-lying area of Fort Eustis, containing many creeks and marshes. A Preliminary Assessment was conducted which resulted in a determination for no further action at this site.

**Sites 11, 12, 13, and 14 - Dredge Spoils Area:** There are four dredge spoils developed during dredging activities in the James River. In December 1975, ketone was spilled into the James River upstream of Fort Eustis. A Preliminary Assessment/Site Inspection (PA/SI) was conducted at the four disposal areas in 1990 to decide if the spoils were contaminated with pesticides and determine if levels would warrant further investigation. No further actions are currently planned for this site.

**Site 11A - Waste Oil Storage Tanks:** The waste oil storage tanks were two 15,000-gallon capacity aboveground storage tanks, not used since 1981. Initially, it was estimated the tanks contained approximately 1,500 gallons of water mixed with 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, methylene chloride, ethylene, and glycol. An interim removal action was conducted in March 1994, including the disposal of 29,598 gallons of waste oil, removal of the two aboveground tanks, and the removal and treatment of 150 cubic yards of contaminated soil.

**Site 11B - Fire Fighting Training Area:** A fire fighting training area was built in 1968 consisting of a smokehouse, aboveground burn tank, a burn pit, a fuel feed system, and a water

conveyance and treatment system, including an oil/water separator. Monthly, approximately 40 to 50 gallons of JP-4 jet fuel was poured into an unlined pit and ignited. Fire fighting training has not been conducted at this site since 1993. A recently completed remedial investigation at this site evaluated surface water, groundwater, and soil contamination and its impact on adjacent ecosystems. Contaminants of concern include metals, petroleum, oil, lubricants, and solvents. In August 1997, EPA submitted comments on a draft RI. The site is still under investigation.

**Site 11C - Oil/Sludge Holding Pond:** In 1979, approximately 5,000 gallons of No. 2 fuel oil was accidentally pumped into a sanitary sewer clean-out connection. The fuel was collected at the sanitary sewage treatment plant by skimming from the clarifier and diverting to a sludge drying bed. A mixture of oil, digested sludge, and fuel residues were present in the sludge. The sludge was disposed in a holding pond and covered with eight to ten feet of earth. In August 1997, EPA submitted comments on a draft RI.

Soil and groundwater investigations at this site detected metals and fuel hydrocarbon heavy fraction in the soil and benzene in the groundwater. More recently, soil and groundwater sampling have confirmed the presence of metals, volatile organic compounds (VOCs), ethylbenzene, and xylene.

**Site 16 - Brown's Lake:** Brown's Lake is a manmade lake that discharges to a small stream and wetland area that eventually drains to the Warwick River. The lake receives runoff and wastewater from the locomotive maintenance area. Sediment samples from upstream, downstream, and the bottom of Brown's Lake show elevated levels of pesticides, PCBs, and metals. A soil cap was placed on top of the contaminated sediments and the lake was refilled. Monitoring of the lake cap and sediments will continue. A draft Feasibility Study was completed in November 2002.

**Site 17 - Bailey Creek:** In August 1997, EPA submitted a comment on the draft RI. Due to the level of contamination in Bailey Creek and the nature of the contaminants, Bailey Creek is being addressed as a site separate from the Site 9, Central Heat Plant. A pre-feasibility study meeting was scheduled for February 1996 to discuss options for remediating Bailey Creek. Levels of PCBs in sediment and fish tissue in Bailey Creek exceed action levels. To monitor these levels and establish a trend, PCBs in the sediment and water in Bailey Creek were sampled in November 1995, May 1996, November 1996, April 1997, and October 1997. They were also sampled in April 1998. A feasibility study for Bailey Creek was reviewed by VDEQ and EPA in June 1997 and August 1997, respectively. EPA submitted comments on a draft RI in August 1997.

An interim removal Action started in December 1999. It involved excavating over 6,000 cubic yards of PCB contaminated sediments, approximately 3,000 cubic yards of which were TOSCA regulated. In order to limit the damage to the wetland area, sediments with concentrations below 5 ppm PCBs were left in place. Backfilling and replanting of the wetland area was completed by the end of Spring 2000. Wetlands restoration monitoring is currently in place. Sampling of the sediments and clams along Bailey Creek will take place to provide data for the ecological risk assessment. That is currently in progress.

**Site 17B - Lead Area:** EPA submitted comments on a draft RI in August 1997. In investigating the PCB levels in Bailey Creek and other contaminants attributable to Landfill #15, it was determined certain segments of Bailey Creek were contaminated with lead. The sediment lead contamination was due to the skeet range next to Bailey Creek. A remedial investigation was conducted at this site confirming potential human health and ecological impacts. The RI Report is final. In March 1998, VDEQ submitted comments on the spring 1997 Sediment and Surface Water Monitoring. Samples of the surface soils / sediments were collected at grid points over the entire skeet range impact area. Samples were sifted and the number of lead shot pellets per square foot area was counted. This work was performed during the summer of 2000. A final report is being prepared.

**Site 18 - Milstead Island Creek Area:** The Milstead Island Creek Ditch Canal is a manmade waterway between the James and Warwick Rivers. As part of the 1989 Remedial Investigation at Landfill #7, samples were collected from the canal, the Warwick River, and where Milstead Island Creek enters the James River. These samples contained several metals. A 1990 study detected pesticides, PCBs, VOCs, Base-Neutral and Acid Extractable Organics (BNAs), and metals. A 1994 study of this area has confirmed the presence of these contaminants. The RI Report is final.

**Site 20 - Old Pesticide Storage Building:** The old pesticide storage building has two contaminated areas. Past activities include storage, handling, and mixing of herbicides and pesticides. PCBs, pesticides, and metals were identified in the 1990 PA/SI. In June 1995, VDEQ received a confirmatory study report.

**Felker Army Airfield Tank Farm:** The tank farm supports the aviation fueling activities for Felker Airfield. A 1992 Preliminary Assessment Screening was initiated to characterize soil and groundwater contamination. Based on the results, an interim remedial action was conducted in March 1994. Approximately 3,800 cubic yards of petroleum-contaminated soil was removed. The fueling system and piping were replaced. A site characterization report has been submitted to VDEQ. Several non-petroleum contaminants were detected and comments have been provided. Additional groundwater sampling at the site is planned.

**DOL Storage Yard, Building 1607:** This site was previously used to store pesticides and herbicides for the Entomology Shop in the late 1970s and early 1980s. The Directorate of Logistics is presently using it for storing building materials and supplies for the installation. In 1993, soil sampling showed the presence of PCBs. The draft RI Work Plan for this site includes the following: delineating the nature and extent of contamination; evaluating potential migration; assessing the risk to human health and the environment; and making recommendations for future study. In November 1995, groundwater, soil, sediment, and surface water samples were collected at this site. Data are currently being evaluated. In October 1997, VDEQ reviewed a draft RI. A draft feasibility study is currently in progress.

**Lake Eustis:** Samples collected from Lake Eustis as a control for a Remedial Investigation showed the presence of PCBs. Due to the concentrations, the Agency for Toxic Substances and Disease Registry recommended additional sampling be conducted. The Army conducted sampling and the results confirmed elevated PCB concentrations. In June 1995, a fishing

restriction was placed on the lake. The draft Remedial Work Plan for Lake Eustis recommended an extensive sampling of sediment, water and fish tissue to characterize and delineate the contamination in Lake Eustis. A draft RI was scheduled for submittal to VDEQ in spring 1998. EPA and VDEQ have submitted comments on the draft RI.

**Building 2005 Petroleum/Oil/Lubricant (POL) UST:** The POL UST site is next to Building 2005 in the fire fighting training area. Since the entire fire fighting training area is under investigation, no further action is planned for this IRP site.

**Site 21 - Helicopter Maintenance Area:** The helicopter maintenance area consists of several buildings used to train personnel in turbine engine maintenance. A JP-4 fueling system used in test runs of the repaired engines is at this facility. A 12,000-gallon UST is at the north end of Building 3307. The underground piping system from the tank has experienced a series of leaks. The entire system was replaced in 1988. A site characterization study was completed in 1993 to assess soil and groundwater contamination. The study determined the presence of light non-aqueous phase liquids and dissolved phase liquids in the unconfined aquifer. Currently, a Corrective Action Plan has been approved by the VDEQ and is being implemented. A free product recovery system has been installed and began operating in early 1996. Wells are being monitored monthly. Free product recovery reports are submitted quarterly.

**Third Port UST Removal Site:** This is a UST site near the Fort Eustis port facility. It consists of a concrete wash pad and a UST that acted as an oil/water separator. The tank was removed in March 1994 with 12 cubic yards of contaminated soil. Site screening samples were collected in October 1994. Four surface and three subsurface soil samples were collected in the vicinity of the former UST and wash pad. The samples were analyzed for VOCs, SVOCs, pesticides/PCBs, and metals. Vanadium was detected above Region III risk screening levels. Site is still under investigation.

**AAFES Service Station Building 1380:** A Site Characterization Report (SCR) has been completed, which describes the geology, hydrology and extent of contamination, assesses the risks, and evaluates remedial alternatives. The May 1995 SCR recommended bailing a free product from the wells. VDEQ requested a six-month bailing and monitoring period followed by soil and groundwater sampling. A free product is being recovered and wells are monitored monthly. The six underground storage tanks at the site were lined and new equipment was installed.

### **Current Site Status**

Fort Eustis was listed on the National Priorities List on December 16, 1994. The EPA is preparing a draft Federal Facilities Agreement to cover future activities at the installation.

### **Community Relations**

VDEQ staff participates on the technical review committee, attends public meetings, and conducts site visits. In August 1994, Fort Eustis completed the Community Relations Plan.

<b>VDEQ Representative</b>	<b>Information Repository</b>
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# Langley Air Force Base

Hampton, Virginia

Superfund Program Site Fact Sheet

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**Type of Facility:** Air Force Federal Facility

**Funding:** The Department of Defense  
Defense State Memorandum of Agreement

**Lead Agency:** Air Force

## Site Description and History

Langley Air Force Base (LAFB) is a 3,152-acre facility in Hampton, Virginia, and is part of the Hampton Roads metropolitan area in the southern end of the lower Virginia peninsula. The Base is between the northwest and southwest branches of the Back River, a tidal estuary of the Chesapeake Bay. LAFB property was primarily used for agriculture before 1916 when the U. S. Government purchased it for use as an aviation research and development establishment. In 1917, LAFB was officially named and is the oldest continuously active air force base in the United States. The mission of LAFB has changed during its history. To support its various missions, quantities of petroleum, oils, lubricants (POLs), solvents, pesticides, photographic chemicals, and protective coatings have been used. Resultant wastes generated include rinse waters, pesticide containers, silver and other metals. Spillage and/or mismanagement of these substances have resulted in the discovery of 45 separate sites at LAFB that are currently under investigation.

LAFB was listed on the National Priorities List on May 31, 1994.

## Current Site Status

**Site LF-01 - Abandoned Landfill:** This abandoned landfill covers approximately 14.5 acres and is at the northeastern end of 08/26 runway near Willoughby Point on the banks of the Back River. The landfill reportedly was used from 1940 to 1950 for the disposal of construction debris and material dredged from the Back River. The site is now a flat, grass-covered area with surface water frequently accumulating in several shallow depressions. A draft remedial action work plan has been submitted.

**Site WP-02 - Abandoned Wastewater Treatment Plant (WWTP):** This site is a former WWTP covering approximately 0.5 acres near Willoughby Point on the banks of the Back River in the northeastern part of the base. The plant operated from 1917 to 1968 as a secondary treatment biological-type facility using trickling filters and discharging to the Back River. The

plant was partially demolished between 1968 and 1978, and all that remains is a rectangular concrete structure, probably once used as a filtration tank. A draft Record of Decision is currently under review by EPA and VDEQ.

**Site SS-03 - Fuel Saturated Area:** The site, possibly saturated with fuel, is northeast of the intersection of Nealy Avenue and Andrews Street in the eastern portion of the base. A possible contamination source is an underground fuel line, used before 1965, and identified as having pinhole leaks. A NFA Decision document has been signed and the site has been closed.

**Site SS-04 - Fuel Saturated Area:** This fuel saturated area covers approximately 4.5 acres along Nealy Avenue and its intersection with Danforth Avenue. The site includes twenty-four 25,000-gallon underground storage tanks (USTs). A steel JP-4 fuel pipe transfer line extends through the site, but has not been used since 1990. In 1992, a groundwater extraction and treatment system for fuel contamination was installed, including a series of well-point vacuum extraction recovery wells. A vacuum decanter tank and oil/water separator to remove free fuel was installed, along with an air stripper to treat recovered water. Due to poor recovery of floating fuel, the treatment system was shut off in 1996. This site is closed.

**Site LF-05 - Abandoned Landfill:** This site is an abandoned 7-acre landfill in the southern portion of the base in the Shellbank area on the banks of the Back River. The landfill was used in the 1930s and 1940s for general disposal. Most of the materials disposed in this site were likely municipal refuse. In addition, drummed waste oil and solvents, lead-based paints, thinners, batteries, tires, fabrics, construction debris, sanitary wastewater treatment sludge, and coal burning-derived fly ash may have been deposited at this site as well. Currently, the site is a flat, grass-covered area, and the only evidence of the presence of a former landfill site is the reported settlement under Nealy Avenue. A final remedial design has been completed and a draft remedial action completion report is currently underway.

**Site OT-06 - Abandoned Entomology Site:** This site is the location of the abandoned entomology building and the Shellbank sewage treatment plant in the southern portion of the base. The site covers approximately 6.3 acres north of Tides Mill Creek in the Shellbank area bordering the Back River. Pesticides, including DDT, dieldrin, chlordane, lindane, and Malathion, were used in the building. The sewage treatment plant was a secondary, biological facility using trickling filters. A wastewater treatment plant sludge disposal area was also on site. Site operations began in 1943 and the entomology building was demolished in the 1960s. The sewage treatment plant was abandoned in 1968. A ROD for NO Further Action was signed in September of 2000.

**Site LF-07 - Abandoned Landfill:** This site is an abandoned landfill covering approximately 13 acres east of the north branch of Tides Mill Creek in the southern portion of the base. It was active from 1947 to 1963 as a general landfill. Most of the materials disposed in this site were municipal refuse, but drummed waste oil and solvents, lead-based paints, thinners, batteries, tires, fabrics, construction debris, sanitary wastewater treatment sludge, and coal burning-derived fly ash may have been deposited as well. A draft O&M plan has been submitted and a draft institutional control implementation plan is currently under review.



**Site WP-08 - Abandoned WWTP:** This site is a former wastewater treatment plant covering approximately 0.7 acres in the northeastern corner of the base. It operated from 1930 to 1962, providing primary treatment to washings/wastewater from the nearby entomology building (OT-25) and discharging to the Back River. It was demolished before 1978. A radar station now occupies the L-shaped lot. The lot is paved with concrete and is underlain with a 3- to 4-foot thick bed of compacted gravel. A remedial investigation work plan is currently unfunded.

**Site OT-09 - Abandoned Gas Cylinder Disposal:** This site is in the lighter-than-air (LTA) area in the northern portion of the base and is next to the banks of the Back River. The site covers approximately 1.8 acres in the on-base housing area. The site was active until 1935 and reportedly was used to bury hydrogen or helium gas cylinders. A geophysical investigation was conducted at this site. No magnetic anomalies were found that shows the presence of buried cylinders at the site. A No Further Remedial Action Plan (NFRAP) Decision Document was signed for this site in November 1997.

**Site LF-10 - Abandoned Landfill, Golf Course:** This site is an abandoned 45-acre landfill beneath part of the golf course in the north central portion of the base, on the south bank of Tabbs Creek. The site was initially used as a practice bombing range from 1917 to 1946, resulting in the presence of buried ordnance on the site. The site was used for undocumented refuse disposal from 1953 to 1965. Most of the materials disposed in this site were municipal refuse. However, the materials may have included drummed waste oil and solvents, empty herbicide containers, paints, thinners, batteries, tires, fabrics, construction debris, sanitary wastewater treatment sludge, and fly ash from coal burning. A final remedial design package has been completed and a draft remedial action work plan is currently under development.

**Site LF-11 - Abandoned Landfill, Tabbs Creek:** The site is an abandoned 16.5-acre landfill on the northern bank of Tabbs Creek in the northwestern portion of the base. The landfill operated from 1965 to 1972, accepting undocumented refuse and wastes. Land filling activities extended up to the edge of Tabbs Creek and in some areas construction extended into the marsh bordering the creek. Most of the materials disposed in this site were municipal refuse. These materials may have contained drummed waste oil and solvents, empty herbicide containers, paints, thinners, batteries, tires, fabrics, construction debris, and sanitary wastewater treatment sludge. A final remedial design has been completed and a draft remedial action work plan is currently under development.

**Site LF-12 - Abandoned Landfill, Munitions Storage Area:** The site is an abandoned 16.5 acre landfill north of Tabbs Creek in the northwestern portion of the base near the munitions storage area. The landfill was used from 1972 to 1981 for disposal of undocumented refuse or debris. Most of the materials disposed in this site likely were municipal refuse, but it may contain drummed waste oil and solvents, paints, thinners, batteries, tires, fabrics, and construction debris. The northeastern portion of the site is used as a storage area for construction material. A draft O&M plan has been submitted and an institutional control implementation plan is currently under review.

**Site LF-13 - Abandoned Landfill:** This site is an abandoned landfill covering approximately 12 acres west of Gregg Road in the northwestern portion of the base. The landfill was used in the

1950s, and aerial photos show activity more than a 10-year period. The depth of landfill material is unknown, and the site has been re-graded, covered with topsoil, and is currently vegetating. There is no documentation of types of waste deposited, but possible materials include drummed waste oil and solvents, lead-based paints, paint thinners, batteries, tires, fabrics, construction debris, sanitary wastewater treatment sludge, and fly ash from coal burning. Historically significant ruins of a "free school" are on-site. A remedial investigation was completed in September of 2000 and a ROD for No Further Action was signed in September of 2000. This site has been closed.

**Site WP-14 - Abandoned Chemical Leach Pit:** This site is an abandoned chemical leach pit covering 3.6 acres, in the north-central portion of the base, near the firing-in abutment (Building 1303). The site is next to the taxiway and was used for collection of a wash down and spills associated with loading pesticides onto spray planes (starting in the 1960s). The area was also used in the 1920s as a practice bombing range and several practice bombs have been unearthed in the area. The site is currently covered with grass and is well maintained. A draft Record of Decision is currently under review by EPA and VDEQ.

**Site LF-15 - Abandoned Landfill, Willoughby Point:** This site is an abandoned landfill covering approximately 3.7 acres in the heavier-than-air (HTA) area in the eastern portion of the base near the banks of the Back River. The site was used between 1937 and 1947 to dispose of old vehicles and construction debris, and may include an old fire truck. A remedial action work plan has been submitted for review.

**Site SS-16 - Fuel Saturated Area:** This site is a fuel saturated area covering approximately 0.4 acres east of the intersection of Dodd Boulevard and Thompson Street in the southeastern portion of the base. Fuel was reportedly stored at the site in USTs associated with a former gas station constructed in the 1930s. There is also evidence from an aerial photograph that four Aboveground Storage Tanks (ASTs) of unknown contents were on the site. Photographs also show a railway line and possible drum storage area on the site, both of which were removed before 1937. VDEQ – TRO notified LAFB in September 1996 that no further corrective action would be required. This site has been closed.

**Site LF-17 - Abandoned Landfill, LTA Area:** This site is an abandoned landfill covering approximately 4.8 acres in the LTA area on the banks of the Northwest Branch of the Back River operated from 1917 to 1945. Most of the materials disposed in this site may have been municipal refuse. However, drummed waste oil and solvents, lead-based paints, paint thinners, batteries, tires, fabrics, construction debris, sanitary wastewater treatment sludge, and fly ash from coal burning may have been disposed as well. This site is also the location of the Small Arms Range and Skeet Range and may have lead contamination associated with these activities. A feasibility study is ongoing.

**Site LF-18 - Abandoned Landfill:** This site is an abandoned 13-acre landfill found west of the munitions storage area next to the NASA property. Undocumented debris was disposed during the 1930s. Most of the material disposed was likely wood, stumps, and construction debris. NASA may also have deposited unknown material. The site is densely overgrown and marshy in some areas, with evidence of recent dumping of domestic trash. A draft remedial action

completion report has been submitted for review and a draft O&M plan is currently under review.

**Site SS-19 - Transformer Storage Area:** This site covers approximately 3 acres in the west-central portion of the base and is the existing storage area for out-of-service electrical transformers containing polychlorinated biphenyls (PCBs). Transformers were stored in the open, on a gravel-covered asphalt base before 1979. Transformers are now stored on a concrete pad in Building 1335. In August 1998 a removal action was conducted at site 19. PCB contaminated soils were extracted and disposed. A No Further Action decision document was signed in December of 1998. This site has been closed.

**Site LF-22 - Abandoned Landfill, Willoughby Point:** This site is an abandoned 7.7-acre landfill at Willoughby Point on the banks of the Back River in the eastern part of the base. This landfill operated in the 1930s, and most of the materials disposed in this site were municipal refuse. However, the materials included drummed waste oil and solvents, lead-based paints, paint thinners, batteries, tires, fabrics, construction debris, sanitary wastewater treatment sludge, and fly ash from coal burning may have been disposed as well. A final remedial design has been completed and a final remedial action work plan is currently underway.

**Site SS-23 - Former Coal Storage Area:** This site is a coal storage area used from 1917 to the early 1960s, covering approximately 0.6 acres on the western side of the Mile-Long Building. Formerly, coal was transported to this location by rail, unloaded, and stored inside concrete-walled impoundment. The impoundment has since been demolished, with only part of the concrete floor remaining. An NFRAP Decision Document was signed for this site in November 1997. This site has been closed.

**Site SS-24 - Abandoned Waste Oil Storage Area:** This site is an abandoned waste oil storage area covering approximately 0.1 acres near a picnic pavilion and parking lot at the southern end of the Munitions Storage Area in the northwestern portion of the base. Waste oils and solvents were collected in 55-gallon drums then emptied into two fiberglass USTs (6,000 and 8,000 gallons) installed in 1972. Material emptied into the tanks included 1,1,1-trichloroethane, methyl ethyl ketone, toluene, PD-680, zinc chromate primers, polyurethane paints, and phenolic strippers. It is thought that hydraulic fluids, waste oil, JP-4 fuel, engine oil, and other chemicals dumped into the tanks had compromised the tank or piping integrity. As a result, the tanks were pumped out in 1986. Spills also occurred while emptying the 55-gallon drums. Based on the contaminants present and the results of the risk assessment, a removal action was conducted in August 1996. The need for further action at this site is currently being evaluated. This site has been closed.

**Site OT-25 - Old Entomology Building:** This site is the old entomology building and pesticide/herbicide storage yard covering approximately 3.5 acres in the LTA area in the northern portion of the base next to the Northwest Branch of the Back River. Entomology operations occurred from 1971 to 1983. Pesticide and herbicide management practices in the building and its surroundings have resulted in contamination of building material, soil, and groundwater near the building. Due to the poor condition of the structure, the site has been identified as a public safety

threat by the Agency for Toxic Substances and Disease Registry. A draft ROD is currently under review by EPA and VDEQ.

**Site ST-26 - West Apron/Control Tower:** This site consists of several fuel-saturated areas near the Control Tower area, found to the south of the main runway. The site was originally identified as Site SS-21 in 1981 and after soil sampling and analysis was conducted, the site was recommended for no further action. Site investigations conducted in 1989 and 90 showed a floating jet fuel plume of approximately 4 acres was present. In addition, surface water and sediment fuel contamination was identified in Brown's Creek. Site SS-21 was closed in 1992 and contamination is being addressed by remediation of Site ST-26. Remedial action is currently underway including recovery trenches for free-floating JP-4 fuel removal and an air stripper for treatment of groundwater. Long term operation of the remediation system followed by long term monitoring is anticipated. This site has been closed.

**Site ST-27 - Danforth Fuel Line Leaks:** This site includes the underground jet fuel line extending from Site ST-34 to ST-26 in the southern part of the base. The approximately 5,000-foot pipeline was used between 1939 and 1990. Many leaks in the pipeline have resulted in contamination of soil and groundwater. Remedial action began in 1992 and ended in 1994. Remedial action efforts included excavation of pipeline and skimming free JP-4 fuel from trenches/wells and the installation of recovery pumps and trenches. This site has been closed.

**Site ST-28 - BX Service Station:** This site is a fuel saturated area covering approximately 3 acres at the BX Gas Station on Pine Road in the south-central portion of the base. Leaks in the gas station's USTs resulted in fuel bubbling up into Brown's Creek, a tributary of the Back River. Remedial action is ongoing (began in 1993, to end in 2000), and includes recovery trenches for free-floating gasoline removal, air stripper for treatment of groundwater, and soil vapor extraction. This site has been closed.

**Site ST-29 - Abandoned USTs, Building 788:** This site covers approximately 0.8 acres in the southeastern portion of the base and consists of a series of eight Underground Storage Tanks (USTs) found under the parking lot next to Building 788. Extensive fill, including gravel, pavement, etc., is present around the tanks. The eight 25,000 gallon tanks were once connected to the jet fuel transfer line but have been out of service for many years. Site contamination may have resulted from leaking. Remedial action (began in 1992 and completed in 1994) included leaving abandoned tanks in place and treating and disposing of contaminated water from tanks to eliminate petroleum contamination according to Virginia UST regulations. This site has been closed.

**Site ST-30 - Engine Test Cell:** This site is a fuel spill at a jet engine test cell (Building 737) found to the east of the Mile-Long Building on Willoughby Point on the banks of the Back River. Jet engines were tested here until 1989. A leak in the concrete containment chamber resulted in a noticeable sheen on the Back River. Unburned fuel from the floor of the test facility and spillage from the fuel feed tank were recovered in the building's oil/water separator. Interim remedial actions completed in 1989 included rapid response remediation of soil and groundwater contamination using an interceptor trench, French drain, and groundwater pumping to eliminate petroleum contamination. This site has been closed.

**Site ST-31 - UST, Fuel Saturated Area:** This site consists of a fuel saturated area covering approximately 0.4 acres with a 60,00-gallon concrete UST, which had been used to store No. 2, No. 4, and No. 6 fuel oils. The concrete UST constructed in 1949 developed cracks and leaked fuel. The UST was drained, relined, and returned to service in 1991. Interim remedial action was completed in 1991 to eliminate petroleum contamination according to Virginia UST regulations by recovering free-floating fuel oil from recovery wells and repairs to the leaking UST. This site has been closed.

**Site ST-32 - Abandoned UST, Building 753:** This site covers approximately 0.1 acres and includes a fuel saturated area and an abandoned UST near Building 753 in the southeastern portion of the base. The UST is a 60,000 gallon concrete fuel tank buried approximately 11 feet underground and was used from 1949 to 1992 to store No. 2 and No. 4 fuel oils. The site was first identified when a leak was discovered on the side of Building 753. Tank closure began in 1992 and was completed in 1993. The UST was filled with an inert material and all openings were sealed to eliminate future use of the tank. VDEQ – TRO issued a closure letter in July 1996. This site has been closed.

**Site ST-33 - Abandoned UST, Building 755:** This site includes a fuel saturated area and an abandoned UST covering approximately 0.1 acres in the southeastern portion of the base. The UST, built in 1949, is a 60,000-gallon concrete tank buried approximately 11 feet underground and was used to store No. 2 fuel oil for the steam generation system. Cracks in the tank resulted in leakage and contamination of soil and groundwater. Remedial action began in 1993 and consisted of filling the tank with inert material, sealing all openings, and leaving the UST in place. Long term monitoring is planned for this site. This site has been closed.

**Site ST-34 - Fuel Farm, Facility 707:** This site is the fuel storage area next to the Back River in the eastern portion of the base. The site consists of six large ASTs. The tanks were built on concrete piers and originally were not covered. Each tank is surrounded by a 5-foot high asphalt-covered earth berm as secondary containment. Investigations to date have not detected any groundwater contamination nor free floating fuel. VDEQ – TRO issued a closure letter in July 1996. This site has been closed.

**Site ST-35 - Abandoned Septic Tank, Golf Course Maintenance Building:** This site covers approximately 0.4 acres in the west-central portion of the base next to the Golf Course Maintenance Building and consists of an abandoned septic tank. The septic tank had been used in golf course maintenance from an undetermined date until the 1970s. Pesticides and herbicides were reportedly disposed of in the tank. Sites ST-35 and ST-53 are the same site. A Site Inspection addendum was completed and a NFA decision document was signed in February 1999. This site has been closed.

**Site OT-38 - Waste Oil and Trash Burn Areas:** The site consists of four former waste oil and trash burn pits base wide. No documentation exists on types of material disposed of at the sites, however, based on interviews, waste oils and solvents were burned in the four pits from 1917 to 1960. Site 38-C also was used to burn trash during the winter when landfill operations were difficult. Presently all four sites are covered with grass. Completion of risk assessments is

anticipated to provide the basis for further action. In September 1998, a PP was issued identifying the proposed no action for soils at OT-38A and OT-38B. In January 1999 a ROD was finalized. OT-38 C and OT-38 D have been incorporated into LF-17 and LF -07 respectively. Site OT-38A and OT-38B have been closed.

**Site OT-40 - Abandoned EOD Training Area, Firing-in Abutment:** This site covers approximately 0.6 acres in the north-central portion of the base and consists of an abandoned Explosive Ordnance Disposal (EOD) training area near Building 1303. The area was used from the 1940s until the early 1980s for small-scale bombing and machine gun training. It was also part of the former bombing range and several practice bombs have been unearthed. An NFRAP Decision Document was signed for this site during November 1997. This site has been closed.

**Site FT-41 Abandoned Fire Training Area:** This site is both a former and present fire training area. It covers approximately 0.5 acres and is between Weyland Road and Worley Avenue in the northern part of the base. The former training area was constructed in 1960 and used until about 1984 when the new pit was constructed. During quarterly fire training exercises, conducted occasionally five times a month, 300 to 500 gallons of waste fuel, JP-4, and hydraulic oils were dumped onto the ground, ignited, and then extinguished. The former pit was not constructed to retain or collect unburned fuel. The present training area, which was constructed in 1985, is equipped with an impermeable concrete liner and an oil/water separator. Propane fuel is now used in all exercises. JP-4 fuel was last used at the site in 1992. The site also lies within an area formerly used as a practice bombing range during the 1920s. Runoff from the training pit may have migrated into nearby surface waters and eventually into Tabbs Creek. A draft institutional control implementation plan has been submitted for review.

**Site WP-42 - Bethel Manor WWTP:** This is the site of a former WWTP in Bethel Manor, the off-base housing complex. The WWTP was a secondary treatment facility treating domestic sewage from the housing complex from the late 1940s to 1968. The plant was also equipped to disinfect final effluent before discharge to surface waters. Since 1968, all sewage is discharged to a POTW. The plant was demolished and no evidence of it remains. The site is no longer owned by the U. S. Air Force. No further actions/investigations are planned pending approval by EPA and VDEQ representatives.

**Site ST-48 - Abandoned Fuel Tanks, Bethel Manor Service Station:** This site is the former gas station covering approximately 0.1 acres in the Bethel Manor, LAFB's off-base housing complex. The site includes up to eight abandoned USTs, buried beneath a parking lot in front of the fire station and medical clinic. The gas station was in use from 1964 to 1984. There is evidence that illegal dumping of paints, solvents, and waste oils into the UST may have occurred. It is also believed that runoff from the site may migrate, via a storm ditch, to the Big Bethel Reservoir. A remedial investigation was recently conducted at this site and it was determined that further investigation would be conducted under the Remediation Program for VDEQ, Tidewater Regional Office (TRO).

**Site ST-49 - Abandoned Fuel Tanks, Building 351:** The site consists of two abandoned 10,000 gallon USTs containing diesel fuel beneath an asphalt area north of the aircraft maintenance shop (Building 351) in the south-central portion of the base. The USTs are still in place but are no

longer in use. The site is situated immediately next to the active flight apron. VDEQ – TRO issued a closure letter in July 1996, no further action is planned.

**Site ST-50 - Abandoned Fuel Tanks, Base Hospital:** This site consists of abandoned USTs used to store diesel fuel near the base hospital in the south-central portion of the base. Three USTs are at the site. One UST was relocated further away from the building and, then, later replaced with a 10,000-gallon tank. A Corrective Action Plan (CAP) is currently ongoing. A Decision Document for NFA was signed in March 1996. This site has been closed.

**Site OT-51 - Abandoned Electrical Substation, Shellbank Area:** This site is an abandoned electrical substation found next to Building 80 at the intersection of Nealy Avenue and Burrell Street in the southern portion of the base. PCB-containing electrical transformers were at the site, but these have been removed. It is believed that transformer oil spillage may have caused PCB contamination detected in base storm sewers in May 1990. A subsequent investigation and sampling for PCBs of storm sewer manholes and sumps in the drainage system in the Shellbank Area detected Arochlor 1260 in several locations including an area around the transformers next to Building 80. A removal action was completed in July 1997 and a ROD for NFA soils was signed in January 1999. This site has been closed.

**Site SS-52 - Fuel Saturated Area, Building 1301:** This site is a fuel saturated area covering approximately 0.1 acres northwest of the Golf Course Maintenance Building 1301. The site includes one AST, a fuel pump, and a UST that are all used to store gasoline and provide fuel for golf carts and maintenance vehicles. The UST was replaced in 1984 when it was determined to have leaks. The area was formerly used as a bombing practice range in the 1920s and practice bombs have been unearthed on the site. Two UST's were removed in February 1998. VDEQ – TRO issued a NFA letter in June 1998. This site has been closed.

**Site OT-55 - Civil Engineering Yard:** This site consists of underground petroleum contamination on approximately 2.5 acres on the edge of the Back River in the southeastern part of the base. The area was used for storage of vehicles and various materials. An area of liquid filled pits can be seen found close to the riverbank in aerial photographs taken in 1959 and 1960. From the early 1950s to 1960, the area was progressively expanded by dumping fill material into the Back River in front of a seaplane hanger. A removal action was completed in 1992 to excavate, dispose of, and backfill approximately 740 cubic yards of petroleum and PCB-contaminated soil. This site has been closed.

**Site OT-56 - Base wide Silver Contamination in Storm Sewers:** This site is the base wide storm sewer system consisting of 53 miles of sewer. The system was built up from 1917. It is now believed to only handle storm water. There is evidence of backflow into the system during storm events. Periodically elevated levels of silver are detected in the storm and sanitary outfall. A Virginia Pollutant Discharge Elimination System permit was modified to include a compliance schedule to investigate the cause(s) of silver contamination. A draft ROD has been submitted to EPA and VDEQ.

**Site SS-61 - Old Civil Engineering Paint Shop/Marina:** This site is the former location of the Civil Engineering Paint Shop in the southeastern part of the base. It consists of a fenced-in

gravel area used for paint and paint thinner storage and as a staging area to mix paints and clean equipment. The paint shop was in operation from the 1950s to early 1991. A UST at the adjacent marina leaked gasoline thought to have spread into the site soil. The UST and some surrounding contaminated soil were removed in 1993. The facility is now used for the administration of the LAFB Yacht Club. A remedial investigation and feasibility study was completed in spring 1998 and a PP was issued in November 1998 recommending institutional controls and ground water monitoring as the preferred alternative. A ROD was signed in September of 2000.

**Site SS-63 – Back River:** This site includes sediments that are adjacent to the other IRP sites at LAFB. Of primary importance are the sediments from the storm sewer outfalls from site OT-56. A PA/SI report was completed in 1999 and a RI/FS project is planned. A draft feasibility study has been submitted.

**Site OT-64 – Basewide Groundwater:** The site includes all groundwater under LAFB. It was established as a separate site in 1998. An FFS and monitoring plan are scheduled for 1999. An additional round of groundwater monitoring was conducted in 2001. A draft geochemical evaluation report has been submitted for review and a draft engineering evaluation report has been submitted.

### Community Relations

VDEQ representatives attend Restoration Advisory Board meetings and conduct site visits. In May 1994, LAFB completed the Community Relations Plan. In February 1997, the Community Relations Plan was revised to incorporate more recent information.

VDEQ Representative	Information Repository
<p>Paul E. Herman, P.E. Remediation Project Manager Virginia Department of Environmental Quality P. O. Box 10009 Richmond, VA 23240-0009 (804) 698-4464, Fax (804) 698-4234 E-mail: <a href="mailto:peherman@deq.state.va.us">peherman@deq.state.va.us</a></p>	<p>Main Branch Hampton Public Library 4207 Victoria Boulevard Hampton, VA 23669</p>



# Marine Corps Combat Development Command Quantico

Quantico, Virginia

Superfund Program Site Fact Sheet

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**Type of Facility:** Marine Corps Federal Facility

**Contaminants:** Department of Defense  
Defense State Memorandum of Agreement

**Funding:** Navy

## Site Description and History

The Marine Corps Combat Development Command (MCCDC) is a 56,000-acre military training facility located in Quantico, Virginia, 35 miles south of Washington, D.C. Portions of MCCDC are located in southern Prince William County, northern Stafford County, and eastern Fauquier County. MCCDC is bordered by Prince William Forest Park to the north and the Potomac River to the east. Residential areas are on base and to the north, south, and west of the base.

Operations at MCCDC began in 1917 when the Department of Defense leased 5,300 acres of land next to the Potomac River near Quantico in order to establish a new marine training camp. In April 1943, 50,985 acres of land was obtained to accommodate increased training activities.

The mission of the installation is to: 1) develop and implement doctrines for all Marine Corps mission areas; 2) develop and implement policies and programs for the training and education of officers, enlisted and reserve Marine Corps personnel; and 3) provide support for Combat Development Command Forces and Headquarters activities.

MCCDC was listed on the National Priorities List (NPL) on June 30, 1994. The current NPL Areas of Concern (AOCs) are described below.

## Current Site Status

There are currently five Remedial Investigation (RI) Sites at MCCDC-Quantico:

**Arsenic Burial Area (ABA):** Several locations have been investigated under the Installation Restoration Program (IRP) to find the Arsenic Burial Area (ABA). In 1997, an area containing two drums of sodium arsenite and other surface debris was located. The area was further investigated in 1998 and determined not to contain buried drums. Soil samples from the 1998 investigation did not show contaminant levels above background levels. While the suspected ABA RI was completed in 1998, information acquired in early 1999 indicated the actual ABA might not have been located. A NFA ROD was signed in 2001.

**Former Rifle Range:** The Former Rifle Range (FRR) originally consisted of a group of skeet, rifle, and pistol ranges. However, subsequent investigations under the IRP extended this AOC's boundaries to encompass an area of former training ranges, approximately one million square meters in size. An EE/CA is currently being worked on to remove hot spots.

The AOC has been impacted by lead and copper from the ranges. In 1994, an Interim Remedial Action (IRA), consisting of fencing, public education efforts and storm water runoff controls was implemented for the original portion of the AOC. The FRR RI was completed in 1999.

**Old Batch Plant:** The Old Batch Plant (OBP) was used to store transformers in the 1970s. IRP sampling determined soil at the OBP contained elevated levels of PCBs. In 1990, an IRA was performed to excavate PCB contaminated soil. RI sampling found PCBs and other contaminants in the sediments of the unnamed creek that drains the OBP area. The OBP RI was completed in 1998 and the No Further Action Record of Decision was signed in 2000.

**Old Landfill:** The Old Landfill (OLF) operated from the 1920s to 1971 on the shore of the Potomac River. Operations at the OLF extended the shoreline 600 feet into the Potomac River. Waste Disposal included municipal refuse, construction debris, paints and thinners, transformers, PCB-contaminated dielectric fluids, waste oils, batteries, compressors, and other hazardous materials. In 1990, an IRA was performed to excavate PCB-contaminated soils. In 1993, the VDEQ issued a Notice of Violation (NOV) for the discharge of PCBs and other contaminants from the OLF violating State Water Quality Standards.

In response to the NOV, the facility implemented additional remedial actions to prevent contaminated storm water runoff from discharging to the Potomac River. In 1995, U.S. Fish and Wildlife Service studies found sediments and biota in the Potomac River near the OLF contained PCB and pesticide contamination at or above levels of concern for the protection of human health. In 1995, at the recommendation of the Agency for Toxic Substances and Disease Registry (ATSDR), MCCDC-Quantico established a fish consumption advisory for carp and catfish caught near the OLF. In 1996, additional IRAs were initiated to remove PCB-contaminated soils and sediment, stabilize slopes, and cover the OLF. The OLF RI was completed in early 2000.

**Pesticide Burial Area:** The Pesticide Burial Area (PBA) was used for a one-time disposal of waste pesticides in 1974. IRP sampling determined soils and groundwater at the PBA contained elevated levels of pesticides. In 1993, an IRA was conducted to remove contaminated soil and the buried pesticides. The PBA RI was completed in 1998 and a No Further Action Record of Decision was signed in 2000.

### ***Site Screening Areas***

There are currently ten Site Screening Areas (SSAs) at MCCDC-Quantico. SSAs are areas where there is sufficient information to confirm an AOC, but insufficient information to determine the contaminant characteristics of the area. SSA characterization efforts approximate CERCLA Site Investigation levels of investigation.

The results of the characterization are used to determine if a SSA will ultimately become a RI site or require no further action. The MCCDC-Quantico Site Management Plan calls for the investigation of five SSAs per year. Over 30 SSP's have been completed in 2002.

### ***Desk Top Audit with Sampling Sites***

There are currently 78 Desk Top Audit with Sampling (DTAWS) sites at MCCDC-Quantico. DTAWS sites are areas where current information suggests the area could be an area of concern, but contains too much uncertainty to qualify it as a SSA. DTAWS site characterization efforts approximate CERCLA Preliminary Assessment levels of investigation. The results of the DTAWS characterizations are used to determine if a DTAWS site requires further investigation as a SSA, a RI site, or requires no further action. Investigation was completed on all sites in 2002. Nine sites were recommended for further action/investigation.

### ***Desk-top Audit Areas of Concern***

There are currently 111 Desk Top Audit (DTA) AOCs at MCCDC-Quantico. DTA AOCs are areas where current information suggests the area had ground-disturbing or other activities that may or may not be of concern. DTA AOC evaluation efforts focus primarily on archival research and personnel interviews. The results of the DTA evaluation efforts are used to determine if a DTA AOC requires further investigation, as a SSA or RI site, or if it requires no further action. Seventy DTAs were closed out in 2002.

### ***Miscellaneous AOCs***

**Brown Field:** A release of JP-4 fuel from the Brown Field underground storage tanks was investigated and remediated under the VDEQ Underground Storage Tank Program.

**Aero Club:** A release of waste oil from an above ground storage tank was investigated under the Installation Restoration Program and is currently being remediated under the VDEQ Underground Storage Tank program.

**Fire Training Area:** A release of metal-contaminated petroleum products from the unlined burn pit was investigated under the Installation Restoration Program and is currently being remediated under the VDEQ Underground Storage Tank program.

**Russell Road Landfill:** The Russell Road Landfill was closed under a Federal Facilities Compliance Agreement with the VDEQ in 1997. Post closure care activities and long term monitoring are currently ongoing.

### ***Community Relations***

In March 1995, MCCDC-Quantico completed the Community Relations Plan. In 1996, MCCDC-Quantico surveyed the base and surrounding community for interest in establishing a Restoration Advisory Board. Due to lack of interest, MCCDC-Quantico decided to continue using the existing Technical Review Committee (TRC) as a platform for its community relation

efforts. In 1998, MCCDC-Quantico held a TRC meeting. The TRC meeting was opened to the public to keep them updated with the Environmental Restoration Activities of the facility. The VDEQ project manager participates in the TRC and other facility-related public meetings and site visits.

<b>VDEQ Representative</b>	<b>Information Repository</b>
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# (Former) Nansemond Ordnance Depot

Suffolk, Virginia

Superfund Program Site Fact Sheet

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<b>Type of Facility:</b>	Formally Used Defense Site (FUDS)
<b>Funding:</b>	Department of Defense Defense State Memorandum of Agreement
<b>Lead Agency:</b>	Army Corps of Engineers
<b>Website:</b>	<a href="http://www.nao.usace.army.mil/Projects/Nansemond/welcome.html">http://www.nao.usace.army.mil/Projects/Nansemond/welcome.html</a>

## Site Description and History

The Former Nansemond Ordnance Depot (FNOD) is located in Suffolk, Virginia, at the end of State Route 135 off of Interstate 664. The site is located on the James River at the mouth of the Nansemond River, six miles across Hampton Roads from Newport News and approximately eleven miles west of Norfolk.

The site, initially used in 1917, consisted of 975 acres of land and has been associated primarily as an army ammunition depot. During World Wars I and II, thousands of tons of all types of conventional ordnance was stored, worked upon, and disposed of at the depot. In 1950, the site was transferred to the department of the Navy, and was used as a Marine Corps supply forwarding annex. The facility was deactivated in 1960 and conveyed to the Beasley Foundation, which operated a boy's military school until 1968. This foundation conveyed most of the property to the Virginia Department of Community Colleges, General Electric and Dominion Resources.

Tidewater Community College (TCC), Frederick Campus now occupies approximately 589 acres. Other occupants of the FNOD include General Electric Company Jet Engine Division (GE), the Hampton Road Sanitation District, the Virginia Department of Transportation, and Dominion Land Development.

The FNOD was listed on the NPL in July 1999. The NPL listing identified the following six source areas. These areas are described below. For additional information and current/future activities at these sites, please see the website listed above.

- 1. The James River Beachfront Area** was used as a general disposal site during the World War II era. The waste disposed of at the JRB was mainly debris waste, including metal and construction and building debris. Large (greater than 5 ft. in diameter) chunks of molten metal were also observed along the eroded bank of the JRB. This area is located on the James River in a portion of the FNOD currently owned by the TCC. This area is now

protected by a revetment, which was constructed after the removal activities. Ordnance scrap discoveries included bomb fins, 170-mm projectile shells and a cannonball (none of which were live). A human health and ecological risk assessment of the site is planned to evaluate soils left in place beneath the revetment as well as soils at the bluff and to satisfy CERCLA requirements.

2. **The TNT Removal Area** is approximately two to three acres in size and is located along the north side of College Drive on the TCC campus. The site was used as a disposal and maintenance area for ordnance related waste, bulk explosives, propellants, small arms ammunition, and scrap metal during the period of 1917 to about 1950. Bulk explosives were removed along with contaminated soil. Some explosive contamination remains in site soils and groundwater. Ordnance clearance continues into 2003. Data collected from the next sampling event will be used along with appropriate historical data to delineate both groundwater and soil contamination. Crystalline TNT located during the ongoing magnetic anomaly investigation will be removed.
3. **The Main Burning Ground (MBG) AOC** is located on the GE property. Previous uses of the site include the burning and cleaning of ordnance during and after WWI and WWII. Currently, the site area is mostly wooded except for former railroad paths and periodic openings in the tree canopy. Contaminants of concern appear to include both organics and inorganics. There are also unexploded ordnance (UXO) issues associated with the site. A removal action for the ordnance was begun in early 2000. A special issue, which impacts this area, is the presence of both ordnance and HTRW.
4. **The Horseshoe Pond** is located on the Dominion Lands property, south of the GE plant and west of the Impregnation Kit AOC, and is approximately 1.2 acres in size. The site was previously used as a disposal and burning area for solid waste and ordnance. Because the site is mostly wetlands and in the Chesapeake Bay resource protection area, it is unlikely to be developed. Contaminants of concern appear to include both organics and inorganics. There may also be UXO issues with the site.
5. **The Impregnation Kit Area (IKA)** is approximately 300 feet in diameter and is located to the south of the GE plant on the Dominion Lands Inc. property. The site was used as a disposal area for WWI impregnation kits and other debris. A final close out report has been completed. The area is intended to be closed out with a No Further Action Proposed Plan and Record of Decision.
6. **The Track K Dump (Tire Pile)** is located on the TCC campus. The site contains abandoned automobile/truck tires and may have been used as a solid waste dump. A removal action was completed and confirmatory sampling was performed in 2002. A No Further Action Proposed Plan and Record of Decision are planned, provided the Site Screen Planning shows no further site investigation is necessary.

#### ***Site Screening Areas:***

1. The Nansemond River Beach Front

2. Streeter Creek/Lakeview Drive Ground Scars
3. Near and Off-shore Areas
4. GE Pond/Nansemond culvert
5. Tidewater Community College Lake and J-Area lake
6. Marine Corps Power Generation Building
7. Area J Lake and Possible Burning Ground Area
8. Abandoned Wastewater Treatment Plant
9. Tract A & B burning ground
10. Track A – Explosive Magazine Line & Eastern Disposal Area/Pit
11. Tract G – Explosive Magazine Line ground scars and mounding
12. Tract H & I – Explosive Magazine Line ground scars and mounding
13. Tract J – Explosive Magazine Line ground scars and mounding
14. Tract K – Explosive Magazine Line ground scars and mounding
15. Tract K – Explosive Magazine Line landfill
16. PCB transformer removal
17. Steam Heating Plant removal
18. Photo lab basement
19. Suspected Underground Storage Tanks
20. Officer's Pool Chlorine Containers

### **Current Site Status**

FNOD was added to the NPL in July 1999. The Army Corps of Engineers, Norfolk District is executing the investigation and remediation activities.

### **Community Relations**

A Restoration Advisory Board (RAB) meets every other month at the Bon Secours Medical Center, Suffolk, Virginia. The Army Corps of Engineers also maintains a Document and Information repository at the Tidewater Community College library.

<b>VDEQ Representative</b>	<b>Information Repository</b>
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# NASA Langley Research Center

Hampton, Virginia

Superfund Program Site Fact Sheet

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**Type of Facility:** NASA Research Center, Federal Facility

**Funding** NASA

**Lead Agency** NASA

## Site Description and History

NASA Langley Research Center (LaRC) is next to Langley Air Force Base in southeastern Virginia in the heavily populated Hampton Roads area. It is on 810 acres of United States Government-owned land. There are approximately 270 structures on site divided between the "west" and "east" areas. The majority (90 percent) of the facilities are in the west area. The west area is bounded by Brick Kiln Creek to the north, Route 172 to the west, and Langley Air Force Base to the south and east.

The primary function of LaRC is research and development of advanced technologies for aircraft and spacecraft. Specific studies center on instrumentation, materials fatigue acoustics, aerodynamics, and guidance control.

LaRC was the first national research laboratory dedicated to aviation. Groundbreaking took place on June 17, 1917, under the authority of the National Advisory Committee for Aeronautics (NACA) created by Congress in 1915. In 1920, LaRC was dedicated and the world's first wind tunnel was completed at the facility. The goal of LaRC was to advance the understanding of aerodynamics. During World War II, LaRC began studying space travel in response to German rocket testing. In the early 1960s, the Mercury astronauts were trained at LaRC. This activity ended in 1962 when the Manned Space Flight Center was opened in Houston, Texas. Since the 1970s, LaRC has focused on testing Space Shuttle systems and unmanned Viking probes. The following sites describe the undergoing environmental restoration in detail:

**Stratton Road Substation, Building 1233:** Stratton Road Substation occupies approximately 2.5 acres and is secured by a perimeter fence. The substation is on the northeast side of the site between Taylor Road and Warner Road, and consists of six major structures: two 119 kV switch gears, two 22 kV switch gears, a control house, and a pump house. Polychlorinated Biphenyls (PCBs) were detected in the substation soil in 1984. The affected area is next to the pump house. Between 1984 and 1987, the focus of site investigations was primarily on soil contamination. Subsequently, three removal actions were completed that met the requirements of the Toxic Substances Control Act (40 CFR 761). In June 1987, four monitoring wells were installed at the

perimeter of the removal action excavation area for groundwater evaluation. Analytical results from these wells show low levels of PCBs in the groundwater in the area. A remedial action consisting of excavation and off-site disposal of contaminated soil and the implementation of institutional controls has recently been completed. A Final Remedial Action report has been approved. A Groundwater Evaluation draft summary report has been submitted.

**AREA E Warehouse:** The Area E Warehouse site occupies approximately 4.5 acres of land. Access to the site is prohibited for the public and limited for LaRC employees. The Area E Warehouse site is currently used to store goods and materials for use in day-to-day operations. During the 1960s, the site was used for temporary storage of drums of waste materials and transformers awaiting transportation for off-site disposal. Small leaks and spills occurred during that time, resulting in minor soil contamination in the Area E Warehouse area. The area of soil contamination totals about 1.3 acres. Concentrations of metals in the soil, including lead, mercury, and manganese, are very low. PCBs in the surface and subsurface soil are low, less than 5 ppm. A Record of Decision was signed in September of 1998 and it presented institutional controls as the selected remedial action for this site.

**Pyrotechnics Area (Chemical Waste Pit):** The Pyrotechnics Area is near Building 1161, northwest of the intersection of Hunsaker Road and Bush Road. Solid explosives, including lead azide and various plastics, were used for on-ground, open air tests conducted at the Pyrotechnics Area. This testing stopped some time in the 1960s. Interviews conducted with employees show the Pyrotechnics Area contains a waste disposal pit within its bounds. It is possible that chemical waste from LaRC was deposited in this pit during 1968. These chemicals, generated during a "closet clean out" of chemicals and chemical waste, were buried in small plastic, metal, and glass containers. Thirty feet in diameter by twenty feet in depth is the approximate dimension of the waste disposal pit. The hole was estimated to be 2/3 full at the time of backfilling.

The alleged disposal pit and other parts of the clearing have been covered with earth and fill material. The area is overgrown with thick brush and small trees. Tidal marshes border the site to the north and small wooded areas are to the south and east. A locked gate and fence to the south and a drainage channel to the east limit access to the site. Extensive investigations have been conducted between 1992 and 1995 to find the chemical waste pit. These investigations have included trenching, soil boring and sampling, and groundwater well installation. However, they have produced no evidence of the disposal pit. A No Further Remedial Action Planned (NFRAP) Record of Decision (ROD) is anticipated for this site.

**Tabbs Creek:** Tabbs Creek is a meandering creek flowing east-northeast into the northwest branch of the Back River and has a wide marsh and thick brush and trees along its perimeter. PCBs and polychlorinated triphenyls (PCTs) are the contaminants of concern. They were inadvertently discharged into the storm sewers and eventually deposited in Tabbs Creek via Outfall 009. A Remedial Investigation (RI) was conducted in 1991 and 1992. The investigation consisted of sampling and analysis of surface water, sediment, and biota samples for both organic and inorganic contamination. It was determined contaminants were present in the sediment and biota specimens found in the creek and, in low concentrations, in surface water samples. The distribution of PCB/PCT sediment contamination is consistent with the

contamination source at Tabbs Creek being storm sewer outfall 009 at the head of the creek. Up to 760 ppm of PCBs and PCTs were detected in sediment samples from the site, with PCTs dominating in concentrations and sampling locations. A Record of Decision was signed in September of 1998 and presented as the selected remedial action for the site. The RA, which consisted of dredging and off site removal of contaminated sediment, was completed in May of 2000. The final year 1 report of the Post Remedial Biomonitoring Activity has been submitted for review.

**Construction Debris Landfill (CDL):** The CDL is on 9.6 acres of land west of Building 1157 and north of the Landing Loads Facility track. The site is bordered by Brick Kiln Creek to the north and two Virginia Pollution Elimination System (VPDES) outfalls (05 along the western boundary and 07 along the eastern boundary). The CDL is accessible by means of an access road. Entrance to the fenced site is through a gate that only partially restricts access.

Currently, the area is vegetating with mature and sub-mature trees, a dense under level ground cover, and a variety of shrubs. Historically, the site has been used for disposal of construction-related debris from the facility and as a staging area for approximately 450 55-gallon drums containing various chemicals and/or waste materials generated at LaRC. To date, analytical results of investigations show the presence of organic and inorganic contaminants in groundwater, surface water, sediment, and soil samples. A feasibility study has been submitted for review.

### **Current Site Status**

LaRC was listed on the National Priorities List in May 1994. In April 1994, the Environmental Protection Agency (EPA), the Virginia Department of Environmental Quality (VDEQ), and NASA entered a Federal Facilities Agreement to cover the management of future activities at the center.

### **Community Relations**

VDEQ staff attends public availability sessions and conducts site visits. In March 1994, LaRC completed the Community Relations Plan.

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# Naval Amphibious Base Little Creek

Virginia Beach, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Naval Base Federal Facility

**Funding:** Department of Defense  
Defense State Memorandum of Agreement

**Lead Agency:** Navy

## Site Description and History

The Naval Amphibious Base Little Creek (NABLC) is a 2,147-acre facility within the city limits of Virginia Beach, Virginia. The Chesapeake Bay lies to the north of the facility, Shore Drive to the south, Lake Bradford and Chub Lake to the east, and the city limits of Virginia Beach to the west. Land use at the base is primarily industrial, while land development surrounding the base is residential, commercial, and industrial. The site was listed on the National Priorities List (NPL) in May 1999.

NABLC was commissioned on July 30, 1945, by combining four contiguous activities. Those activities were (1) the Amphibious Training Base encompassing the southwestern corner of the present Little Creek facility; (2) the Construction Battalion Training Center consisting of most of the facility's current acreage; (3) the U. S. Naval Section Base; and (4) the Armed Guard Training Center. The base's mission was the training of landing craft personnel for operational assignments. Over the last 50 years, NABLC has expanded in both area and the complexity of its mission. Currently, NABLC provides logistic facilities and support services to local commands, organizations, other United States and allied units, home ported ships, and commands of the operating forces meeting the amphibious warfare training requirements of the Armed Forces of the United States.

Operations that occurred at the NABLC included: vehicle and boat maintenance, boat painting and sandblasting, construction and repair of buildings and piers, mixing and application of pesticides, electroplating of musical instruments, laundry and dry cleaning, medical and dental treatment, and generation of steam for heat. Wastes generated and disposed at NABLC included: pesticides, paints, solvents, inorganics, heavy metals, polychlorinated biphenyls (PCBs), mixed municipal wastes, nickel plating baths, chromic acid, silver cyanide, lacquer stripper, perchlorethylene sludge, soap, dyes, and degreasers.

## **Current Site Status**

**Site 5 - Motor Oil Disposal Area:** Site 5 consists of the area between Buildings 9 and 11 and is approximately 100 feet by 150 feet. A small, concrete berm drum storage area, approximately 10 feet by 10 feet, and an oil-water separator were on the northern side of Site 5 along Building 9. Building 11 was originally built as a cable tank building.

The building contained three pits near the center of the floor, covered by steel plates. From 1969 until 1981, motor oil, solvents, and antifreeze from boat engines maintained in Building 11 were reportedly disposed into these pits through holes in the steel plates. Previous reports showed 2,295 gallons of oil were generated annually from activities in Building 11. If similar quantities are projected back to 1969, as much as 43,000 gallons may have been disposed at Site 5. Several rounds of soil and groundwater samples have been conducted, to date, with results showing only low levels of TPH. These results show reports of disposal may have been grossly overstated. Based on a 1998 Groundwater Monitoring Report, a No Further Remedial Action Plan (NFRAP) Decision Document is anticipated for this site.

**Site 7 - Amphibious Base Landfill:** The Amphibious Base Landfill, operated from 1962 to 1979, is approximately 38 acres at the south central portion of the base. The landfill received all base waste produced between 1968 and 1979 and it contains nearly 500,000 cubic yards of waste. Most of the waste likely consists of nonhazardous solid waste. However, the landfill may have received some hazardous wastes since it was the general receptacle for all wastes generated at the facility. A Remedial Investigation and Feasibility Study (RI/FS) was completed at this site in 1997. In 1998, the Navy issued a final decision document showing the chosen remedy to be institutional control with long term monitoring. A draft Remedial Investigation/Human Health Risk Assessment report is currently under development.

**Site 8 - Demolition Debris Landfill:** This landfill operated from 1971 until 1979 and it was primarily used for disposal of inert materials. The landfill reportedly covered approximately 2 acres, with waste disposed to a depth of 3 feet. Approximately 4,840 cubic yards of waste are contained in the landfill. Waste included mercury-contaminated carpeting from the demolition of the dental clinic, debris from buildings destroyed by fire, concrete pipe, and debris from the bar screen in the base sewage pump stations. A draft RI/HHRA is currently under development.

**Site 9 - Driving Range Landfill:** The Driving Range Landfill, operated from 1952 to 1956, is approximately 6 acres in the northeast portion of the base. A network of sand dunes paralleling the Chesapeake Bay shoreline makes up the northern perimeter of the landfill. During this period, an incinerator was active on the western perimeter of the landfill and, apparently, burned combustible materials generated by NABLC. The resulting ash was disposed in the Driving Range landfill along with any noncombustible item bypassing the incinerator. It is estimated the landfill contains approximately 40,000 cubic yards of waste. The site is currently used as a golf driving range. The depth of cover on the surface of the driving range is unknown. In 1997, the Navy issued a draft final decision document recommending institutional controls and long term monitoring of the groundwater as the preferred remedy for this site. A final ROD is currently under review by EPA and VDEQ.

**Site 10 - Sewage Treatment Plant Landfill:** This landfill, operated from 1941 until 1968, is approximately 18 acres in the northeast portion of the base. Site 10 was the only landfill in operation at NABLC until the opening of the Driving Range Landfill in 1952; all waste generated at the base from 1941 to 1952 was deposited at this landfill. The base continued to deposit sewage sludge at the site from 1952 to 1968.

Waste in the landfill was initially deposited directly into the water of Desert Cove and it filled approximately five acres of the cove and continued into marshy lowlands to the north. The average depth of the landfill is 6 feet yielding a waste volume of 46,500 cubic yards. In 1997, the Navy issued a draft final decision document recommending institutional controls and long term monitoring of the groundwater as the preferred remedy for this site. A final ROD is currently under review by EPA and VDEQ.

**Site 11 - School of Music Plating Shop:** The School of Music Plating Shop electroplated musical instruments from 1964 to 1974. The shop was in Building 3651 and consisted of an in-ground concrete tank, used to neutralize plating baths, and its associated piping. The neutralization tank had a diameter of 5 feet and a depth of 11 feet. Approximately 2.5 cubic yards of crushed limestone were placed in the pit to neutralize the acidic plating bath waste. Following neutralization, the wastewater was discharged into the storm sewer. The plating bath commonly contained silver cyanide, copper cyanide, chromic acid, nickel plating baths, acids lacquer, and lacquer stripper. A removal action was conducted in 1995 for the tank and its associated piping and groundwater monitoring is currently being conducted. A final supplemental RI is being developed.

**Site 12 - Exchange Laundry Waste Disposal Area:** Dry cleaning operations took place at Site 12 from 1973 until 1978. As much as 1,320 gallons of PCE, soap, sizing, and dye were disposed in a storm sewer or on the ground between 1973 and 1978. A draft feasibility study is under development.

**Site 13 - Public Works PCP tank and Wash Rack:** The PCP tank, with a capacity of 300 to 400 gallons, was used from 1960 through 1974 to treat wood with pentachlorophenol (PCP). Kerosene, tar, paint, and solvents were also present in the dip tank. Near the dip tank there was a wash rack for cleaning vehicles and equipment with steam or solvents and drying racks for treated wood. A removal action for PCB contaminated soil was completed in 1999. A draft FS is under development.

**Site 16 - PCB Capacitor Spill, Pole No.425:** After a lighting strike in the early 1980s, less than 5 gallons of dielectric fluid were found missing from the capacitor, formerly attached to Pole No.425. A removal action, consisting of excavation and disposal of PCB-contaminated soils, was completed in 1995 and the site was formally closed. No further action is planned for this site.

## **Community Relations**

Although a federal facility may provide its own community relations program, it must be consistent with the Comprehensive Environmental Response, Compensation, and Liability Act

(CERCLA), the National Contingency Plan, and the Environmental Protection Agency (EPA) policies. Staff at the Virginia Department of Environmental Quality (VDEQ) reviews and comments on documents such as community relations plans, fact sheets, slide shows, etc. Staff also participates in Restoration Advisory Board (RAB) and public meetings, as requested; visit site locations; and provide additional community relations support, as needed.

<b>VDEQ Representative</b>	<b>Information Repository</b>
Paul Herman, P.E. Remediation Project Manager Virginia Department of Environmental Quality P. O. Box 10009 Richmond, VA 23240-0009 (804) 698-4464, Fax (804) 698-4234 E-mail: <a href="mailto:peherman@deq.state.va.us">peherman@deq.state.va.us</a>	NABLC Library Building 3004 8th Street, NAB Little Creek Norfolk, Virginia 23521 (757) 464-7691



# Naval Surface Warfare Center Dahlgren

Dahlgren, Virginia

Superfund Program Site Fact Sheet

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<b>Type of Facility:</b>	Naval Federal Facility
<b>Funding:</b>	Department of Defense Defense State Memorandum of Agreement
<b>Lead Agency:</b>	Navy

## Site Description and History

The Naval Surface Warfare Center Dahlgren (NSWC) is on the western shore of the Potomac River, King George County, Virginia, approximately 25 miles east of Fredericksburg and 50 miles south of Washington, D.C. NSWC is divided into two principal sites: the Main Site, consisting of 2,678 acres, and the Explosive Experimental Area (EEA), consisting of 1,614 acres.

In 1918, NSWC was established with the primary mission of testing all ordnance materials. Since then, the mission of NSWC has evolved from the traditional proving ground to research-and-development operations. NSWC, under the jurisdiction of Naval Sea Systems Command, hosts the Naval Space Command, the Naval Space Surveillance Center, and the AEGIS Training Center.

The installation currently has many sites in the Installation Restoration (IR) Program being assessed according to a defined Site Screening Process; several have been found in need of further Remedial Investigation/Feasibility Studies (RI/FS). The objectives of the RI are to:

- identify the type, extent, and concentrations of contamination in soil, groundwater, surface water, and sediment
- determine whether, potentially, contaminants are moving from the sites to reach humans or wildlife
- identify and describe potential effects of site-related contaminants on human health and the environment

The first round of RI field studies focused on eight sites on the NSWC Main Site. Subsequently, other groups of sites which are designated the Priority 1 Sites and Priority 2 Sites have been assessed according to the defined Site Screening Process; the Priority 1 Sites have entered the RI study phase. These sites are located on both the Main Site and the EEA. These studies include:

- geophysical surveys to define the extent of landfills and to identify areas with buried metals

- sampling of existing and newly installed groundwater wells (6 to 20 feet deep)
- surface water (ponds, creeks, streams, and ditches)
- sediments (from creeks, streams, and pond bottoms)
- soils (surface and subsurface); reviews of site history and aerial photography
- ecological studies to evaluate risks to the biological environment from exposure to contaminants
- evaluation of site and chemical characteristics influencing where and how contaminants move

The following descriptions of the current IR study sites include summaries of what was found. All eight sites have moved to the Record of Decision (ROD) stage. RODs define the selected remedy for the most effective site cleanup. Long-term monitoring (LTM) is being conducted at five sites. Wetlands monitoring is being conducted at one site. Detailed descriptions and results can be found in the RI/FS and ROD reports. When completed, these reports are placed in the information repository (see the end of this fact sheet).

**Site 2 - Fenced Ordnance Burial Area:** This site was used from the 1940s into the 1980s for disposal of metal ordnance items that could not be certified explosive-free, even after the explosive was burned out of them. Buried items include ordnance hardware and casings, scrap metal, asbestos pipe wrappings, and batteries. Investigation of sediment, soil, surface water, and groundwater has confirmed the presence of metals, rubber, and plastics. The RI/FS of this site is complete, and the ROD has been signed. A major component of the RD/RA -- capping as a hazardous waste landfill -- is complete. Post Closure Care, including groundwater monitoring, is being conducted.

**Site 3 – Ordnance Burn Structure:** The Ordnance Burn Structure (known as USEPA SWMU-42) is located in the Powder Burn Area of the central part of the Mainside. This site is an open field, approximately 0.2 acres in size. A metal box and a burn pan were located at the site to support operations but have since been removed. This site began operation in the 1960s and was closed in September 1994. The site was approximately 6 feet by 6 feet and 4.5 feet high on a gravel base. Site 3 also includes a popping furnace structure, located east of the burn areas.

Operations at Site 3 consisted of thermally treating explosive or explosive-contaminated waste in burn pans, in a steel box, in the popping furnace structure, or on the ground surface. Wastes burned at Site 3 may have included RCRA-listed hazardous wastes and characteristic reactive wastes. The wastes may have included the following:

- Wastewater treatment sludges from the processing of explosives
- Spent carbon from the treatment of wastewater containing explosives
- Rocket Motors
- Explosive Powder, and
- Other Ordnance-Related Items.

A groundwater monitoring plan was initiated to address any potential groundwater contamination. Quarterly groundwater sampling was conducted to meet Virginia Hazardous Waste Management Regulations.

A PRAP was prepared for Site 3/44 recommending no further action be taken at this site (U.S. Navy, 2000a). The PRAP was advertised for public comment starting July 20, 2000 and ending August 19, 2000. No written comments were received during the 30-day public comment period, or the Public Meeting held on August 9, 2000. The Navy, USEPA and the Commonwealth of Virginia signed a Record of Decision (ROD) in September 2000 (U. S. Navy, 2000c).

**Site 9 - Disposal/Burn Area:** This inactive landfill operated from the early 1940s to 1984. Past operations consisted of typical municipal and miscellaneous waste disposal from housing and industrial operations, including a classified paper incinerator that produced ash. Large quantities of wood (packing crates and construction debris) were burned at this site. Investigations of surface water and sediments have confirmed the presence of pesticides, metals, and petroleum products. The RI/FS of this site is complete, and the ROD has been signed. All components of the RD -- isolating from groundwater with a slurry wall and capping as a sanitary waste landfill - - are complete along with the RA. Post Closure Care, including groundwater monitoring, is being conducted.

**Site 10 - Hideaway Pond:** This site is a 15-acre manmade pond created along a marshy drainage area flowing into Gambo Creek. Streams flow through the nearby 1400-area landfill drain into Hideaway Pond. Mercury is the primary contaminant found in Hideaway Pond. It was detected in fish and in surface water samples collected from the pond and tributaries draining Site 17 (1400 Area Landfill), which drains onto Site 10. Fish are sampled annually to monitor mercury levels. The pond is restricted to trophy and catch-and-release fishing. A ROD was prepared to evaluate alternatives for the most effective cleanup of this site. Mercury monitoring of fish and the implementation of institutional controls was the approved remedy.

**Site 12 - Chemical Burn Area:** This site was frequently used in the 1960s and 1970s. It was originally used for burning small amounts of decontaminated chemical warfare agent solutions. Fuel oil or gasoline was likely used to burn waste in the pit. In later years, lab chemicals and polymers were occasionally burned here. Investigations of soils and shallow groundwater confirmed the presence of solvents (chlorinated and non-chlorinated) and petroleum products.

The Remedial Investigation/Feasibility Study if this site is complete, and the Record of Decision has been signed. It calls for a bench scale version of the selected remedy -- Air Sparging and Soil Vapor Extraction -- that has been approved and is currently functioning.

**Site 17 - 1400 Area Landfill:** This inactive landfill was used from the early 1970s until about 1978. Municipal waste was periodically deposited, compacted, and covered. Metals are the primary contaminants of concern at this site, as mercury was detected in surface water samples from both tributaries adjoin it. Mercury in surface water from this site may be the source of mercury detected in Hideaway Pond (Site 10). In addition, groundwater and surface water at Site 17 were found to contain both metal and organic contaminants. The RI/FS of this site is complete, and the ROD has been signed. Vegetative soil cap and off-site disposal of sediments and phytoremediation were implemented as defined in the ROD. Post Closure Care, including groundwater monitoring, is being conducted.

**Site 19 - Transformer Drainage Area:** It is reported that during the 1950s about 1000 gallons of transformer oil were drained onto the ground at this site, behind the present Defense Reutilization and Marketing Office, Building 120B. Polychlorinated biphenyls (PCBs), typically found in transformer oils from this time period, were found at this site in surface soils. No PCBs were found in the groundwater. Since the RI, cleanup at this site has resulted in the removal and proper disposal of 282 tons of PCB-contaminated soils. This removal was completed in May 1995. Subsequently, an Addendum RI/FS for soils at this site was prepared to support the ROD. No further action was determined for the soils at this site. The final groundwater assessment will occur with Site 40, and adjacent site.

**Site 25 - Pesticide Rinse Area:** This site was previously used for rinsing and calibration of spraying equipment and rinsing of pesticide containers on the ground surface. The two areas of concern were a low-lying wetland, south of Building 946, and a past chemical dry well, west of Building 134. Investigations of soil, groundwater, and surface water sediments confirmed the presence of pesticides, primarily in surface soils. Since the RI, this site has undergone additional evaluation and study. Ultimately, a ROD was signed with the selected remedy of excavation and off-site disposal of contaminated soils, construction of a stormwater culvert to divert the cooling pond discharge to flow across the restored/created wetlands.

**Site 29 - Battery Service Area:** This site consists of a below-ground limestone pit used, from the 1950s through the mid-1980s, for the neutralization of battery acid from handling and recharging sulfuric acid batteries. The former pit is now covered by asphalt. Low levels of metals, typically found at lead acid battery recycling sites, were found in soil and shallow groundwater. Since the RI, cleanup at this site has included the removal of approximately 200 cubic yards of PHC- and lead-contaminated soils. Subsequently, an Addendum RI/FS was prepared to support the ROD which consisted of no further action.

Additionally, EE/CAs have been used -- prior to completion of the RI/FS -- to support faster cleanups through Removals at some sites. An EE/CA was used to identify contaminated soils at Site 03 and Site 44 -- two adjacent sites known as the Powder Burn Area -- for disposal off site as a Removal Action. Also, EE/CAs were done on two depleted uranium sites where Removal Actions are currently ongoing.

**Site 44 – Rocket Motor Pit:** The Rocket Motor Pit (known as USEPA SWMU 41) is located next to the Ordnance Burn Structure (Site 3), north of Bagby Road in the Powder Burn Area in the central part of the Mainside. It is approximately 24 feet by 36 feet, with a depth of approximately 5 feet. The facility applied for a RCRA permit to operate the site, however, operated under interim status until September 1994 when the site was closed.

One RI/FFS was prepared for the combined Sites 3 and 44 because the sites are located closed together and were used to perform similar types of operations. The RI/FFS was performed to assess residual risk following the removal action and groundwater monitoring.

A PRAP was prepared for Site 3/44 recommending no further action be taken at this site.

**Site 58 – Building 1350 Landfill:** Building 1350 Landfill (known as USEPA SWMU 134) is located on Mainside adjacent to Kennel Road and extends down into Gambo Creek. The site is basically an extension of the Disposal Burn Area (Site 9). This site was in use during the same period as the Disposal Burn Area (from the 1940s to 1970s).

RI field activities included the installation of one groundwater well at the center of the landfill Site 58. A soil boring was taken at the well location.

A Final Closure Design for Site 9 (which included Site 58) was completed in February 1999. The Remedial Action to remove debris at Site 9 started in March 1999 and was completed in June 1999. A Final Closure Report for Site 9 was submitted in November 2000. The Closure Report documents the construction process and describes the activities that were performed in executing the closure of the landfill, marsh areas, and Site 58. The Long-Term Monitoring Plan for Site 58 is included with the plan for Site 9.

### **Current Site Status**

NSWC was proposed for the National Priorities List (NPL) on February 7, 1992, and on October 14, 1992, was added to the NPL by the Environmental Protection Agency (EPA). Currently, the Federal Facilities Agreement under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 120 (September 1994), establishes the procedural framework and schedule for RI studies and developing, implementing, and monitoring appropriate response actions at NSWC. At present, Appendix A consists of the following. Eleven Priority 1 sites. Six priority 2 sites, Nine Priority 3 sites and six Priority 4 sites. At present, Appendix B consists of thirty-one sites.

### **Community Relations**

Community relation's activities are conducted throughout the IR process. In September 1992, a Technical Review Committee was established, including two representatives from the public. This group was the predecessor to the Restoration Advisory Board (RAB) which was created in October 1994. The RAB provides a forum for discussion and information exchange between community members, the Navy, EPA, and VDEQ. It gives people who might be affected by waste cleanup at NSWC an opportunity for participation. The RAB is not a decision-making body, but is intended to provide diversity of perspective by including citizen participation. RAB meetings are open to the public and are held in easily accessed public locations, in the evening, so people will find it convenient to attend. Meetings are announced in the Journal for King George County and in the Free Lance-Star, at least two weeks in advance. RAB leadership is provided jointly by a Community Co-Chair and a Navy Co-Chair.

A Community Relations Plan outlining a program to provide communication and information exchange opportunities was prepared in 1992. It will be updated when RI results are approved. It will include the names and phone numbers of RAB members so the public can call to discuss issues of interest. A fact sheet describing various aspects of the IR Program has been distributed to a mailing list.

<b>VDEQ Representative</b>	<b>Information Repository</b>
<p>Eric J. Salopek  Remedial Project Manager  Virginia Department of Environmental Quality  P. O. Box 10009  Richmond, VA 23240-0009  (804) 698-4427, Fax (904) 698-4234  E-mail: <a href="mailto:ejsalopek@deg.state.va.us">ejsalopek@deg.state.va.us</a></p>	<p>Smoot Memorial Library  9533 Kings Highway  King George, VA 22485  (540) 775-7951</p>

# Norfolk Naval Base (Sewells Point Naval Complex)

Norfolk, Virginia

Superfund Program Site Fact Sheet

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**Type of Facility:** Naval Base Federal Facility

**Funding:** Department of Defense

**Lead Agency:** Navy

## Site Description and History

The Norfolk Naval Base (NNB) is on 4,631 acres northwest of the City of Norfolk, Virginia. The Naval Complex includes the Norfolk Naval Base and other naval facilities. NNB is bounded by Willoughby Bay to the north, the confluence of the Elizabeth and James Rivers (forming Hampton Road) to the west, and the City of Norfolk to the southeast. Land in the area surrounding NNB is used predominantly for industry. NNB provides shore facilities and logistics support for Navy vessels and aircraft. Reportedly, 260 tenants on the Base support Navy activities worldwide. Approximately 170 shore activities and fleet commands, including Marine Corps units and the North Atlantic Treaty Organization's (NATO) Supreme Allied Command, Atlantic are at NNB. It is the homeport for more naval vessels than any other Atlantic port. This base was originally founded in 1917 by Presidential Proclamation.

The installation was listed on the National Priorities List (NPL) April 1, 1997. Waste generated at NNB includes halogenated and non-halogenated solvents; corrosives, battery electrolytes; paint waste; wastes from electroplating operations; contaminated petroleum, oils and lubricants; and off-specification, excess, or out-of-date commercial chemical products. In addition, the facility manages used oils, construction debris, PCBs, contaminated oil, general trash, and materials that contain asbestos.

The 22 Installation Restoration Program (IRP) sites have been identified. These sites include landfills, a drum storage yard, PCB transformer storage and work areas, slag piles, pesticide shop disposal areas, aircraft maintenance, and a salvage yard. Eighteen potential sources of contamination have been identified at NNB. Twelve potential sources were not evaluated because sampling data are lacking. The six sources evaluated include the Camp Allen Landfill, the slag pile, the Q area drum storage yard, the transformer storage area, the pesticide disposal site, and the CD landfill. The site may include other sources and suspect areas. Twenty-five Solid Waste Management Units (Swims) are being investigated at NNB.

Groundwater samples revealed volatile organic compounds (VOCs), metals, PCBs, and pesticides at elevated concentrations. Soil samples uncovered metals, VOCs and semi-VOCs, pesticides, and PCBs at elevated concentrations. Surface water runoff from six sources flows

either to the Elizabeth River or to Willoughby Bay, converging with the Chesapeake Bay approximately 3-4 miles downstream from the sources. The Willoughby Bay drainage base includes wetlands and fisheries. Fisheries within 15 miles downstream of the site in Willoughby Bay and the Chesapeake Bay are subject to potential contamination from NNB.

**Status (March 1998):** A Remedial Investigation/Feasibility Study (RI/FS) has been completed and cleanup remedies have been selected for the Camp Allen Landfill, CD Landfill, Q Area Drum Storage Yard, and the LP-20 areas. Construction of a groundwater treatment system has been completed for the Camp Allen Landfill. Site investigation work has started at eight other disposal areas.

Following is a detailed description of the sites undergoing environmental restoration.

**Site 1 - Camp Allen Landfill (CAL)** - Land filling operations were conducted from the early 1940s to 1975 at CAL. CAL includes areas A and B. Material disposed at this 45-acre landfill included pesticides, metal plating and parts cleaning sludge, and miscellaneous debris. A removal action (cleanup) was completed in December 1994 for Area B. The final RI report was completed in July 1994. The final FS and baseline Risk Assessment were completed in November 1994. The Decision Document was completed in 1995. A groundwater treatment plant began operations at the end of 1996. Remedial activities have been completed, including installation of extraction wells and execution of Dual-Phase Vapor Extraction System (DPVE).

**Site 2 - NM Slag Pile** - The NM Slag Pile covers approximately two acres of land. The site was used for disposal of slag generated from aluminum smelting operations in the 1950s and 1960s, resulting in lead contamination in area soils. An additional investigation was planned in 1996. RI/FS is complete. A Proposed Remedial Action Plan (PRAP) and Records of Decision (ROD) were completed in 1998.

**Site 3 - Q-Area Drum Storage Yard (QADSY):** The QADSY is an area where new drums of material were stored before being issued to the fleet. This five-acre fenced earthen yard was used from the 1950s until late 1980s. Most of the drums contained new petroleum products, paint thinners, and pesticides. Leaking drums have caused stained areas within the yard. RI/FS and risk assessment was completed in 1995. Remedial activities began in 1996, with installation of a Dual-Phase Vapor Extraction System. The system is currently in operation.

**Site 4 - P-71 Transformer Storage Area** - These 0.5 acres was used to store new and out-of-service electrical transformers from the 1940s until 1978. Reportedly, transformer oil was drained from out-of-service transformers onto the ground surface. A RI performed in 1992 revealed PCB contamination in the top three feet of soil and in the shallow groundwater. The predominant contaminant was Aroclor 1260. An FS, PRAP, and remedial design were done in 1991 and remedial action completed in 1992. The site is currently used for utility vehicle parking.

**Site 5 - Pesticide Disposal Site** - This site, in the southeast of Building V-95, was used for disposal of waste pesticide materials from the 1960s until 1973. Approximately 100 gallons per week of chlordane, Malathion, DDT, DDD, and dieldren were disposed using the French drain



system. A 1988 study revealed contamination in the soil but not in the shallow groundwater in the vicinity. An RI/FS is in progress. Currently, this area is fenced off and used for storage of other materials. A removal action was completed in March of 1998 to remove contaminated soils. Following the removal, No Further Action is warranted.

**Site 6 - CD Landfill** - This landfill occupies approximately 30 acres and is east of Hampton Boulevard and south of the Naval Exchange. This area was primarily used for the disposal of inert, nonhazardous waste from 1974 until 1987. Disposed materials included construction debris, salvage fuel boiler and power plant ash, dust containing cadmium and sandblasting grit containing lead, and miscellaneous inert waste. The Environmental Protection Agency (EPA) toxicity testing, performed in 1981, found the dust hazardous for cadmium. After 1981, the cadmium-contaminated material was disposed offsite at a permitted hazardous waste disposal facility. Seabee Road, separating the eastern and western portions of the landfill, was constructed over the landfill in 1993. The draft RI, completed in December 1994, showed disposal/landfill activities have affected soils, shallow groundwater, surface water and sediment. In July 1999, the landfill was capped as part of the ROD signed in Sept 1998. Arsenic, beryllium lead, and manganese were prevalent in soils. Semi-volatile and pesticides were also found in one soil boring. However, cadmium contamination was not found during the RI. Monitoring of the deeper Yorktown Aquifer did not reveal elevated levels of organic or inorganic contaminants. Surface water and sediments in drainage ditches, next to the site, had slightly elevated levels of semi-volatiles, pesticides, and metals. Elevated levels of PCBs were also detected in shallow sediments.

An FS was completed in 1995 for this site. A proposed remedial action plan and a Record of Decision (ROD) were completed in February 1998 closing the landfill as a solid waste landfill.

**Site 7 - Inert Chemical Landfill** - This landfill is south of the CD Landfill. It was used for a one-time disposal of inert chemicals, primarily unused ion exchange resins. Eighty-four pallets of materials were buried in June 1979 with the approval of the Virginia Department of Health (VDH), Solid and Hazardous Waste Management Division. No further action is recommended for this site because of the inert, nonhazardous nature of the disposed materials. A closeout report was completed in December 1997.

**Site 8 - Asbestos Landfill** - This landfill, located east of the Inert Chemical Landfill, was used for a one-time disposal of asbestos materials generated during a ship retrofitting operation. Approximately 6,500 bags (double-bagged) of asbestos were buried in June 1979 with the approval of the VDH, Solid and Hazardous Waste Management Division. No further action is recommended for this site because the disposed materials were nonhazardous and the VDH approved the landfill. A closeout report was completed in 1997.

**Site 9 - Q-Area Landfill** - This landfill is on the northwestern corner of the NNB created by dredging operations in the early 1950s. This area was used for the disposal of construction debris from 1974 until 1978. No further action was recommended for this site in the 1983 Initial Assessment Study (IAS) since the landfill was used for nonhazardous construction debris. However, further investigation was warranted based on new information. The site is currently under further investigation.

**Site 10 - Apollo Fuel Disposal Sites.** The two disposal sites are in the NM area. One site is a fenced place about 40 feet long and 20 feet wide on the north of the Taussig Cans area. From 1967 until 1969, three or four drums of fuel component from two or three Apollo spacecraft capsules were disposed by pouring the fuel component (monomethylhydrazine) onto the ground surface and allowing it to percolate. The site was abandoned because of its proximity to a drainage ditch. The fence was, then, moved to another site near Building NM-37. The disposal procedure practiced at this site was the same with approximately the same quantity of disposed material.

Inspection of both Apollo Fuel Disposal sites during the 1983 IAS showed the vegetation was not visibly stressed because of the past disposal operations, therefore, no further action was recommended. A closeout report was completed in December 1997.

**Site 11 - Instrument Repair Shop Drains** - Unknown quantities of radium waste from ship dials were poured down the sink drains in this shop in Building V-60, contaminating the drainpipes and sink traps. The shop was operated from the late 1940s until 1956. As an interim measure to address the contamination, the drain traps were plugged with concrete to prevent flushing of the radium into the storm sewer system and into Willoughby Bay.

In 1982, Chem Nuclear was awarded a contract to remove the low-level radiological contamination in the Building V-60 plumbing and the cleanup was completed. In 1991, remediation (decontamination, demolition, and disposal) of Site 19 (Buildings V-60/V-90) included this site as well. No further action is recommended.

**Site 12 - Alleged Mercury Disposal Site** - Approximately 150 ten-pound glass bottles of elemental mercury were reportedly dumped off the seawall near Building V-88 into Willoughby Bay in the late 1960s. In 1976, divers probed sediments for the glass container and samples were collected from Willoughby Bay at the alleged dumpsite for mercury analysis. No evidence of mercury or glass containers was found. No further action was recommended. A closeout report was completed in December 1997.

**Site 13 - Past Industrial Wastewater Outfalls** - Many industrial wastewater streams generated by NNB operations were discharged to the storm sewer system and, ultimately, to Willoughby Bay. These discharges included metal plating solutions, rinse water (chromium, cadmium, zinc, and cyanide), cleaning solution, and paint stripping waste.

In the mid-1970s, the industrial waste streams were rerouted to the Industrial Wastewater Treatment Plant (IWTP) serving as a centralized pretreatment facility, with the effluent being discharged to the Hampton Roads Sanitation District (HRSD) sewage treatment plant. Approximately 100,000 gallons per day have been routed to the IWTP since it began operation in 1976. Discharges from the storm sewer system from the NNB (storm water runoff, steam condensate, and non-contact cooling water) are permitted under the National Pollutant Discharge Elimination System (NPDES). No further action was recommended.

**Site 16 - Chemical Fire, Building X-136** - In July 1979, a chemical fire occurred in Building X-136 because of incompatible chemical storage, predominantly of calcium hypochlorite and acids. During the fire fighting operation, approximately two tons of calcium hypochlorite were flushed down the storm drain with water and discharged to the Elizabeth River. Inspection of the chemical fire site during the 1983 IAS showed the site had been adequately cleaned up and no further action was recommended. A closeout report was completed in December 1997.

**Site 17 - Chemical Fire, Building SDA-215** - In August 1981, a chemical fire occurred in cell six of Building SDA-215 because of incompatible chemical storage (calcium hypochlorite and acids). After the fire, the site was cleaned by removing the hazardous chemicals and the contaminated soil next to this building. The materials were hauled off to a permitted hazardous waste disposal facility. Inspection of the site during the 1983 IAS showed the site had been decontaminated, therefore, no further action was recommended. A closeout report was completed in December 1997.

**Site 18 - Former NM Hazardous Waste Storage Area** - This site, used from 1975 until 1979 to store drums of hazardous wastes (oil, metal plating solutions and sludge, various chlorinated organic solvents, acids, and paint stripping solutions), was an open earthen yard located east of the Taussig Cans in the NM area. Considerable leakage and spillage occurred in July 1979. Consequently, a pit was excavated and an existing drainage ditch was widened and lengthened to convey waste oil and contaminated storm water runoff to the unlined pit. The waste was periodically pumped from the pit into a tank truck and transported to the IWTP for treatment.

Sampling and analysis of the soil in the spill area showed it was contaminated with metals, primarily chromium and cadmium, but a sample of the soil, when tested for EP toxicity, was non-hazardous. The contaminated soil was excavated and placed in piles near the spill area.

A landfill permit was issued by the VDH in October 1980 for the one-time disposal of the contaminated soil by grading and seeding it to establish a vegetative cover. This permit required a continuing monitoring program to determine if contaminant migration was occurring. Monthly monitoring of the standing water from the pit from February 1980 through April 1982 showed the Virginia Groundwater Standards for cadmium, chromium, cyanide, and phenols were slightly exceeded on a sporadic basis.

In the IAS, no further action was recommended for this site. Monitoring of the former NM hazardous waste storage area is no longer conducted as part of the NPDES monitoring programs because the former discharge point has been removed by regrading activities. A closeout report was completed in December 1997.

**Site 19 - Buildings V-60/V-90** - These buildings, now demolished, were aircraft hangars for maintenance and repair of F-14 and A-6 aircraft. In 1986, a fire occurred in electrical switch gear in Building V-60. The electrical equipment at the source of the fire contained PCBs (Aroclor 1260). PCB-contaminated soot was visible in Buildings V-60 and V-90. An RI/FS was completed in 1989 and the following chemicals were found in these buildings: beryllium (aircraft brake materials), radium 226 (aircraft instrument paint), PCBs, polychlorinated dibenzofuran

(PCDF), polychlorinated dibenzodioxin (PCDD), asbestos, acids, solvents/degreasers, and pesticides.

The extent of the contamination led to the decision to decontaminate the salvageable materials in the buildings and to demolish them in 1989. Sampling, completed in late 1991, verified the cleanup was successfully completed.

**Site 20 - LP-20 Building** - This is one of the many large buildings located northwest of the Naval Air Station's (NAS) main runway. The building currently houses an aircraft engine overhaul and maintenance shop, but it was previously used for a plating operation. A large fuel storage area is just south of the building.

Cleaning solvents have been released to the soil and groundwater, possibly through the storage areas and floor drains of Building LP-20. Fieldwork for the RI/FS was completed in February 1995, the RI/FS was completed in 1996, and remedial action began in 1997. A groundwater/soil vapor extraction system has been operational since the spring of 1998. The LP-20 Building is still under investigation.

**Site 21 - Building W-316** - This building, located east of Pier H at the Naval Station, is a PCB small storage facility still used by the Navy Public Works Center (PWC) to store various electrical components, including transformers. The Preliminary Assessment Site Investigation (PA/SI) was completed in 1996 and a removal action was completed in February 1998.

**Site 22 - Camp Allen Salvage Yard (CASY)** - This site, located between Area A and Area B of Camp Allen Landfill Site, was operating from 1940s until 1995. CASY activities included storage and management of waste oils, chemicals, acids, paint thinners, pesticides, transformers, scrap industrial/commercial equipment, metal smelting, and miscellaneous incineration. A PCB spill occurred in 1989 and a preliminary cleanup was conducted.

A PA/SI was completed in May 1994. The investigation results showed that surface and subsurface soils were contaminated with PCBs, pesticides, and metals. The groundwater contamination in the area was addressed by the Camp Allen Landfill implemented cleanup action. A RI was completed in 1998 and a feasibility study is currently underway with a PRAP and ROD expected to be signed by 2003.

### ***Solid Waste Management Units (SWMUs)***

Twenty-five SWMUs are being investigated at NNB. These SWMUs are described below and they are currently under investigation to decide if further action is warranted.

**SWMU-1 - SP-2B Hazardous Waste Accumulation Area** - This site is one of many accumulation areas at the NNB used for temporary storage of hazardous waste containers. The waste is picked up periodically for off-site treatment, recycling, and/or disposal.

This area is outdoors, northeast of Building SP-2 next to a Coast Guard trailer on A Street. This unit is approximately 6 feet and has a concrete base, bermed, with a wooden roof and caged to

prevent unauthorized access. Although this unit is currently used to store equipment, in the past, it handled industrial waste moved biweekly to a Resource Conservation and Recovery Act (RCRA)-regulated storage area.

In the RCRA Facility Assessment (RFA), a moderate potential for release to the soil/groundwater was determined due to the deterioration of the concrete base. Soil sampling was recommended and completed by Baker. Elevated concentrations of acetone and several semi-volatiles were detected. Sampling and analysis was accomplished in 1996 and determined the need for further investigations. A removal action is planned.

**SWMU-2 - Building Z-309 Former Ash Hopper Storage Area** - This unit, located next to Building Z-309 in the western portion of NNB, received ash from boiler operations. Daily ash collected was sent to an off-site waste landfill. This unit operated from 1967 until 1986 when building Z-309 salvage fuel boilers ceased burning municipal waste.

In the RFA, a moderate potential for release to the soil/groundwater was determined due to the presence of soil surrounding the unit's concrete pad. Analysis of soil samples was recommended and initiated by Baker in 1995. Soil analysis was completed and no further action was recommended.

**SWMU-3 - Building Z-309 Oil/Lubricant Storage Area** - This area, located next to Building Z-309 in the northwest portion of the NNB, was used for storage of oils and lubricants used in the Z-309 area. Drums were stored horizontally on racks 18 inches above a soil and a gravel base.

In the RFA, a high potential for release to the soil and groundwater was determined due to the presence of heavily stained soil beneath the drum racks. Analysis of soil sampling was recommended and performed by Baker in 1994-1995.

**SWMU-4 - PWC Sandblast Area** - This area is in the northwestern corner of the NNB next to Building Q-72 and next to the Elizabeth River. It is used to perform sandblasting of barges. The Area of Concern (AOC) is approximately one-half acre and is underlain by soil. Storm water runoff and spray from operations at this site, discharging into the Elizabeth River, is NPDES-permitted.

Sandblasting material migrates to the Elizabeth River during periods of precipitation. Sampling and analysis was done by Baker in 1995 using a geoprobe. Additional sampling was conducted in 1996. The site is currently still in use.

**SWMU-5 - LF-61 Waste Holding Tank** - This site consists of an aboveground storage tank (AST) with a holding capacity of approximately 5,000 gallons located approximately 25 feet south of Willoughby Bay. The AST serves as a holding tank for waste generated at Buildings LF-53, LF-38, and LF-34. A concrete wall surrounds the AST, approximately 3 feet high, with a concrete base that may be cracked.

In December 1989, the AST overflowed in Building LF-38 due to frozen pipes. Approximately 100 to 500 gallons overflowed to surrounding solid and Willoughby Bay. Contaminants consisted of chromium, cadmium, nickel, and zinc. Baker performed sampling and analysis of the groundwater and soil in 1994-1995.

**SWMU-6 - Building V-28 Waste Pit** - This site consists of a subsurface concrete pit used to hold wastes from a metal plating shop within Building V-28. The ground surface of the entire area, covered with approximately 6 inches of concrete, is between buildings V-28 and V-4. Gates restrict access to the area. Willoughby Bay is approximately 200 feet north of the site.

The concrete sump, used to collect metal plating wastes, was stopped in late 1987. Sampling and analysis of the groundwater and subsurface soil was done by Baker in 1994 and 1995. Currently the site is in the scoping phase for a RI workplan. The pit and surrounding soils have been removed.

**SWMU-7 - LF-18 Aircraft Ramp** - This aircraft ramp, located east of Building LF-18 in the northern portion of the Naval Aviation Depot (NADEP) area, currently serves as a parking lot for civilian workers. Willoughby Bay is immediately east of this site. A 1963 aerial photograph showed potential petroleum staining of the ground surface and suggested the staining resulted from seaplane activities. Sampling and analysis of the groundwater and subsurface soil was done by Baker in 1994 and 1995.

**SWMU-8 - Fire Training School** - This site, in the extreme southwest portion of the NNB near the Norfolk International Terminal, is used by U. S. Navy personnel to train in extinguishing various types of fires under a variety of conditions. The facility operates three fire pits and two buildings used to practice fire training techniques. The ground is entirely covered with asphalt and concrete. Access to the site is restricted during non-working hours.

In 1940 to 1990 aerial photographs show petroleum staining of the surface within the site, likely from fuel oil used in fire fighting training activities. Site sampling and analysis were done by Baker in 1994-1995. Currently the site is being investigated further and is scheduled for more sampling.

**SWMU-9 - LP-200 MAC Terminal** - This area is east of Building LP-167 and south of the taxiway for runway 28. The area immediately east of Building LP-167 has a concrete surface and is used as a tune-up area for Jet engine aircraft (F-14s). The land, located east of the engine tune-up area, is grass-covered and is drained by a surface water drainage ditch that parallels the taxiway. From the vegetation present along the ditch, it appears the ditch is wet year around.

In 1949-1954 aerial photographs showed a solid waste and fill disposal area consisting of coarse-textured materials with possible discarded objects. Sampling and analysis of the surface soil was done by Baker in 1994-1995.

**SWMU-10 - LP-200 MAC Terminal East** - The site extends from the MAC Terminal parking area, northward, just south of the runway 28 taxiway. The site includes part of the Weapons Station near Building NM-25 and it is entirely grass or shrub-covered. Portions of the site are

mowed periodically near the MAC Terminal and Building NM-25. A drainage ditch intercepts the southern portion of the site and, then, it parallels the western boundary. The drainage ditch is tidally influenced. In 1954 to 1990 aerial photographs show small disturbed and graded areas with possible activities observed at various locations. Sampling and analysis of the surface soil and groundwater was done by Baker in 1994-1995.

**SWMU-11 - Old Weapons Station Entrance** - The entrance is west of Patrol Road within the boundary of the Weapons Station area. The site, containing two separate areas, is a grass-covered field that slopes southward to a tidally influenced tributary of Mason Creek. Drainage ditches line the entrance and discharge to the tributary. Wooded areas outline the boundary of the fields to the north. A radio communication station is east of the site, on the opposite side of the Weapons Station security fence.

In 1949 and 1954 aerial photographs show mounds of multi-toned materials and stacked objects. Sampling and analysis of the surface soil and groundwater was done by Baker in 1994 and 1995.

**SWMU-12 - Disposal Area Near NM-37** - Building NM-37 is a vehicle maintenance building within the Weapons Station Area. The facility services trucks, forklifts, and other military vehicles within the Weapons Station. The ground surface is covered with an asphalt surface and the surrounding area is well vegetated and heavily wooded. The facility operates two Hazardous Waste Accumulation Areas (HWAAs). One, located directly north of the building, is a metal container used for mowers, oils, and hydraulic fluids. The second area, on the northwest side of the building, is a hazardous waste storage area and is used for the storage of solvents and paints.

A 1958 aerial photograph shows a possible disposal area marked by ground-surface scarring. Sampling and analysis of the surface soil was done by Baker in 1994 and 1995.

**SWMU-13 - Disposal Area Behind Slag Pile/PWC Operations** - This disposal area, in a wooded area north of Building NM-92, is used to store various storage units used for the transportation of equipment. Two manmade drainage ditches divide the site and water has been observed in both ditches.

In 1937 to 1949 aerial photographs show a possible disposal area based on the irregular area of a disturbed ground surface. Sampling and analysis of the surface soil and groundwater was done by Baker in 1994-1995.

**SWMU-14 - Q-50 Satellite Accumulation Area** - This area, in the northeast corner of NNB, is a concrete containment area approximately 15 feet by 25 feet. It is used to store waste generated from oil cleanup activities around the base such as absorbent booms, oil-contaminated soils, and trash picked up from oil spills. Previous site visits showed petroleum staining at several areas. Sampling and analysis of the surface soil was done by Baker in 1994 and 1995. The site is currently being investigated further under the Q Area Landfill.

**SWMU-15 - W-130 Hazardous Waste Accumulation Area (HWAA)** - Building W-130 is used as a forklift maintenance building. The former HWAA, on the northern side of the building, has a gravel surface and large paved parking areas near the site.

The HWAA, although no longer used as an HWAA, formerly managed waste oils and wash rack sludge generated during forklift maintenance. It generated one to two 55-gallon drums of each material per month. Earlier site visits revealed areas of stained surface soils. Sampling and analysis of the surface soil was done by Baker in 1994-1995.

**SWMU16 - NM-37 Accumulation Area** - This area, located northeast of Building NM-37 and within the Weapons Station area, is a vehicle maintenance building that services trucks, forklifts, and other military vehicles. The NM-37 Accumulation Area was designated to accumulate waste materials. The ground surface near Building NM-37 is covered with an asphalt surface and the surrounding area is well vegetated and heavily wooded.

Although there is no history of releases, site visits observed areas of stressed vegetation. Sampling and analysis of the surface soil were done by Baker in 1994 and 1995. The site is under investigation.

**SWMU-26 - North East of NM-31** - This site is in the south central portion of the NNB. A 1938 aerial photograph showed many mounds of light-toned materials. Sampling and analysis of the surface soil was done by Baker in 1994 and 1995. Further investigation revealed that no further action was necessary.

**SWMU-27 - Mason Creek Embankment** - This wooded site, located along the western bank of Mason Creek near the eastern end of Runway 28, is in an area of disturbed surface soils. Aerial photographs from 1987 show materials may have been disposed in this area. Sampling and analysis of the surface soil was done by Baker in 1994 and 1995. No further action is warranted.

**SWMU-28 - Probable Solid Waste Disposal South of CEP 201** - This site is defined by a solid waste and disposal area with dark-toned mounds of material, debris, and probable earthen materials intermixed with debris. It is on an asphalt surface south of Building CEP 201. This area is a storage facility for large objects or equipment awaiting shipment. Tractor trailers are also kept in this area until they are needed for material transportation.

The debris and material are visible on a 1982 aerial photograph. Sampling and analysis of the subsurface soil was done by Baker in 1994 and 1995.

**SWMU-29 - Solid Waste Disposal Area/CD-3/CD-4** - This site, located south of Admiral Taussig Boulevard, consists of a mound of material. 1958 and 1963 aerial photographs show this area was used for solid waste disposal. At the time of the photographs, the disposal activities were inactive and the mound of material was vegetated. Sampling and analysis of the subsurface soil was done by Baker in 1994 and 1995. No further action was warranted.

**SWMU-30 - Sludge Fill Disposal Area/Marshy Area South of Runway/North of Camp Allen** - This area, located south of the west end of Runway 28, is entirely grass covered. It appears that during period of heavy rain, surface water may accumulate in the disposal area. Bousch Creek enters a concrete culvert and passes beneath the west end of the runway area. A manmade drainage ditch bounds portions of this site.



In 1949, 1968, and 1991 aerial photographs show this area was used for the disposal of sludge and fill material. Sampling and analysis of the subsurface soil was done by Baker in 1994 and 1995. No further action is warranted.

**SWMU-32 - Solid Waste Disposal Area/CEP-160/161 Embankment** - This area, in the southwest corner of the intersection of Admiral Taussig Boulevard and Second Street, is a gravel parking lot in the pier area formerly used for waste and fill disposal. Surface waters drain to a drainage ditch on the southern side of this site. These waters discharge directly to the Elizabeth River. 1968 and 1982 aerial photographs verify this area was used for waste and fill disposal. Sampling and analysis of the subsurface soil was done by Baker in 1994 and 1995.

**SWMU-33 - Debris Piled at Seawall/Corner of Sustain Pier** - This former debris pile is at the floating dry dock USS Sustain, next to the Elizabeth River on the western side, and bordering the dry-dock area, on the northern side. This pile is partially covered with asphalt. A gravel parking lot is south of the dry-dock area. A Satellite Accumulation Area (SAA) is also located within the area. A 1963 aerial photograph shows debris was mounded and buried in this area. Sampling and analysis of the subsurface soil was done by Baker in 1994 and 1995.

**SWMU34 - Solid Waste Disposal CEP 200** - This is a grass-covered, mounded disposal area between Building CEP 156 to the north and Building CEP 200 to the south. In 1996 aerial photography shows that debris was stored in this area. Sampling and analysis of the subsurface soil was done by Baker in 1994 and 1995.

**SWMU-35 - Solid Waste Disposal CEP 196 / Resolute Embankment** - This site is in an area east of the floating dry-dock USS Resolute. Part of the site forms a peninsula that extends into the Elizabeth River. The peninsula is grass covered while the northern portion is in an asphalt parking lot. A 1982 aerial photograph shows this area was used for waste and fill disposal. Sampling and analysis of the subsurface soil was done by Baker in 1994-1995.

## **Community Relations**

A federal facility may provide their own community relations program; however, it must be consistent with CERCLA, the National Contingency Plan, and the Environmental Protection Agency (EPA) policies. VDEQ staff members review and comment on documents such as Community Relations Plans, fact sheets, slide shows, etc. They also participate in Restoration Advisory Board and public meetings, as requested, visit site locations, and provide additional community relations support, as needed.

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# Norfolk Naval Shipyard

Norfolk, Virginia

Superfund Program Site Fact Sheet

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**Type of Facility:** Naval Base Federal Facility

**Funding:** Department of Defense

**Lead Agency:** Navy

## Site Description and History

The Norfolk Naval Shipyard (NNSY) is on the southern branch of the Elizabeth River in the city of Portsmouth, Virginia, 8 miles upstream from the confluence of the James and Elizabeth rivers. The following cities surround the NNSY: Portsmouth to the immediate west, Chesapeake to the east and south, and Norfolk to the north. The land areas of Chesapeake and Norfolk are separated from NNSY proper by the southern branch of the Elizabeth River to the east and by the confluence of the southern, eastern and western branches of the Elizabeth River to the north. NNSY consists of more than 1200 acres with four miles of shoreline, 30 miles of paved roads, 19 miles of railroad track, seven dry-docks, and more than 500 buildings.

NNSY lies entirely within the corporate boundaries of the City of Portsmouth, Virginia. Although not actively engaged in ship repair functions, two annexes are under the control of the shipyard:

- Southgate Annex, containing most warehousing and service structures, is a long-term radioactive material storage area within Southgate. This annex is within the corporate limits of Portsmouth, Virginia.
- St. Helena, currently inactive and in the corporate limits of Norfolk, is presently leased to the City of Norfolk. Plans are to turn it over to another parent command. This annex has never been engaged in NNPP radioactive work of material storage.

Beginning in 1963, NNSY was authorized to overhaul nuclear ships. Between 1965 and 1980, many nuclear submarines were repaired and conventional powered surface ships ranging from destroyers to aircraft carriers. Since 1980, the shipyard has provided a full range of industrial, manufacturing, and technological processes required for overhauling and repairing the modern high technology Navy warships such as: minor and major valve repair, overhaul, and replacement; repair and alteration of piping systems; calibration of mechanical and electrical measuring instruments and equipment; overhaul of motors and generators; test and inspection of components and systems; as well as refueling.

In 1975, the Department of Defense (DOD) initiated the Installation Restoration (IR) Program to study disposal activities for hazardous and toxic materials at Navy and Marine Corps facilities. An Initial Assessment Study (IAS) was conducted at NNSY in 1982, followed by more detailed analyses in 1988 and 1992. Of the 19 sites investigated, 8 were finally recommended for additional study and they are currently under study in the IR Program.

The Navy's IR Program matches the process outlined in the U.S. Environmental Protection Agency's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund program. The various study stages are:

- Preliminary Assessment/Site Inspection (PA/SI) identifies potential threats to human health and the environment.
- Remedial Investigation (RI) analyzes contaminants and evaluates potential contamination migration from a site and risks to human health and the environment.
- Feasibility Study (FS) evaluates feasible cleanup methods to achieve environmental standards for human health and the environment.
- Proposed Remedial Action Plan (PRAP) outlines feasible alternatives and recommends remediation or cleanup method, if necessary.
- Public Comment Period/Meeting allows for public examination of the PRAP and expression of comments; public meeting held to present plan and answer questions.
- Record of Decision (ROD) specifies the cleanup method after evaluating public comments.
- Remedial Design (RD) involves preparation of construction specifications and other design plans for remediation.
- Remedial Action (RA) remediates or cleans the site to approved environmental standards.

The next study conducted was an Interim Remedial Investigation (IRI). Based on the results, a Remedial Investigation and Feasibility Study (RI/FS) is currently in progress.

NNSY was listed on the NPL on July 26, 1999.

### **Current Site Status**

**New Gosport Landfill at Norfolk Naval Shipyard (NNSY):** This project involved the removal of abrasive blast material containing paint chips from Navy and private property. Screening of the soil/blast mixture removed extraneous material (concrete, wood, etc.) and stabilization with fertilizer reduced disposal cost by more than \$1.4 million. The local community was involved through the whole project by participation in Restoration Advisory Board meetings and Navy distribution of project status fact sheets and flyers. This allowed the remedial design to incorporate the creation of 1.9 acres of new wetlands along Paradise Creek and still realize significant overall project savings. NNSY won the 2001 Chief of Naval Operations Environmental Award for Environmental Restoration at a US Navy installation.

**Site 2 - Scott Center Landfill:** The Scott Center Landfill is approximately 3 to 4 acres in size and lies next to Paradise Creek on the western side of NNSY. The site was occasionally used during the 1950s for disposal of waste generated from dry dock operations. Waste reportedly

disposed included abrasive blast grit, paint residues, sanitary waste, solvents, and other industrial residues. Also, hydraulic fill, a waste consisting of fine sand, clay, and water generated from maintenance dredging of nearby waterways, was disposed in the landfill. This material comprises the base of the landfill. The site is currently waiting for funding to cap the landfill.

**Site 3 - Sanitary Landfill and Associated Sites:** The Sanitary Landfill was used as the base landfill from 1945 through 1983. Waste disposed at this site included salvage waste; abrasive blast grit; boiler fly and bottom ash; residential trash and refuse; and industrial wastewater treatment plant sludge. The area is still used for oil reclamation operations.

**Site 4 - Chemical Holding Pits:** This is on the northern portion of Site 3. Five chemical waste pits received waste between 1963 and 1978.

**Site 5 - Oil Reclamation Area:** This area soils were contaminated with petroleum products from a 10,000-gallon tank removed in 1982.

**Site 6:** This is an area east of Site 4 where solvents were disposed whenever the pits at Site 4 were full. This site was used from the mid-1960s to 1977.

**Site 7 - Bermuda Disposal Area:** This site was used between the late 1950s and 1970s. The exact type and quantity of waste disposed is unknown.

**Site 9 - Waste LiMe Pit:** Site 9 is a semi-aboveground bermed impoundment on the east side of the NNSY. Waste calcium hydroxide (lime) sludge from NNSY's acetylene manufacturing plant was stored at this site following the closure of the plant in 1971. A removal action and site remediation are planned in March 2003.

**Site 17 -Building 195 and Vicinity:** Site 17 consists of the NNSY metal plating shop in Building 195 and the area immediately next to the north of the building. Plating solutions may have contaminated the building floor and soils next to the site from the early 1970s through 1982. Contaminated soil was excavated and removed during the rehabilitation of the plating shop in 1982. The ground surface north of the building has been completely paved over. The site is recommended for no further action.

## **Community Relations**

Periodic meetings are held with local officials, civic groups, state and federal environmental regulators and NNSY through a forum called the Restoration Advisory Board. Public participation is encouraged. Members of NNSY and local communities have been interviewed and a Community Relations Plan has been developed. The plan contains information on the history and process of the environmental studies, the sites, and the community. It also outlines methods to keep the community informed on the sites during the various IR study stages and it is periodically updated.

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# USN St. Julien's Creek Annex

Chesapeake, Virginia  
Superfund Program Site Fact Sheet

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**Type of Facility:** Navy Base Federal Facility

**Funding:** Department of Defense

**Lead Agency:** United States Navy

## Site Description and History

The St. Julien's Creek Annex (U.S. Navy) is located in southeastern Virginia at the confluence of St. Julien's Creek and the Southern Branch of the Elizabeth River in the city of Chesapeake. The northern boundary of the annex is the boundary between the cities of Portsmouth and Chesapeake, Virginia. The Elizabeth River and St. Julien's Creek form the eastern and southern boundaries, respectively, of the annex. A residential section of Chesapeake City abuts the annex on the west. Norfolk Naval Shipyard is located less than one mile to the north. St. Julien's Creek Annex occupies approximately 490 acres, including 407 acres of land, 14 acres of marsh, and 69 acres of surface water.

The St. Julien's Creek Annex began operations in 1849 as an ordnance and material storage facility. In 1898, the facility was equipped for assembling ammunition. From 1898 to 1970, the facility was used to supply ammunition to the fleet in addition to loading, assembling, issuing, and receiving naval gun ammunition, and conducting experimental and test loading for new ammunition.

In 1969, St. Julien's Creek was disestablished under U.S. Department of Defense and was consolidated as an annex to the Naval Weapons Station, Yorktown, Virginia. Ordnance operations at the facility were terminated in the 1970s.

In 1977, the annex was transferred to the Norfolk Naval Shipyard. In 1995, it was transferred to Naval Base, Norfolk, and then it was transferred to Naval Station, Norfolk, in 1996. St. Julien's Creek Annex currently provides administrative offices, light industrial shops, and storage facilities for tenant naval commands. Currently, its primary mission is to provide a radar testing range (35 acres) and various administrative and warehousing structures.

## Threats and Contaminants

Former operations at the facility that generated potentially hazardous substances include metal plating, degreasing, painting, operation of hydraulic equipment, vehicles and locomotives, ordnance loading, ordnance testing, ordnance disassembly, ordnance destruction, pest control,

maintenance of lead-acid batteries, and printing. Trash and garbage generated from the facility was disposed in on-site dumps. Wastes were typically disposed in low areas, which are wetlands. Beginning in the late 1930s, waste ordnance materials were disposed on site. On-site disposal and storage of waste created numerous sources of potential contamination, including landfills and an ordnance disposal (burning) area. Sources of potential contamination located on the facility include four landfills, an ordnance disposal area, an ordnance burn pit, a hazardous waste disposal area, a waste storage area, and a pesticide disposal area. These sources were noted because of their potential to release to the surface water surrounding the facility, i.e., Blows Creek, St. Julien's Creek, and the Southern Branch of the Elizabeth River. The Southern Branch of the Elizabeth River provides habitat for numerous species that are identified as threatened or endangered under federal or state legislation. In addition, wetlands are associated with the river. Both St. Julien's Creek and the Southern Branch of the Elizabeth River are used for recreational fishing.

### **Current Site Status**

This site was proposed as an NPL site on February 4, 2000. The site was formally added to the list in the July 27, 2000, making it eligible for federal cleanup funds. A soil and background study was conducted in 2001. The objective was to establish background concentrations of metals, pesticides, and PAHs in surface and subsurface soil, and groundwater for use in the comparison of site data. Background levels are due to naturally occurring or anthropogenic sources. A Site Screening Assessment (SSA) was finalized in 2002. This SSA covered eight sites and 12 areas of concern. This SSA recommended further investigation at five of the sites/AOCs to determine if a release of contaminants have occurred. A Remedial Investigation was completed for Sites 3, 4, 5 and 6 in 2002 and included human health and ecological risk assessments. Site 6 has undergone a non-time critical removal action and is projected for closeout during 2003.

### **Community Relations and Concerns**

A federal facility may provide their own community relations program; however, it must be consistent with CERCLA, the National Contingency Plan, and the Environmental Protection Agency (EPA) policies. VDEQ staff members review and comment on documents such as Community Relations Plans, fact sheets, slide shows, etc. They also participate in Restoration Advisory Board and public meetings, as requested, visit site locations, and provide additional community relations support, as needed.

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# Yorktown Naval Weapons Station

## York County, Virginia Superfund Program Site Fact Sheet

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**Type of Facility:** Naval Federal Facility

**Funding:** Department of Defense  
Defense State Memorandum of Agreement

**Lead Agency:** Navy

### Site Description and History

The Yorktown Naval Weapons Station (Yorktown NWS) is a 10,500-acre facility in central York County on the Virginia Peninsula. The installation produces, maintains, and stores ordnance used by the Atlantic Fleet. It was originally named the U.S. Mine Depot and was commissioned on July 1, 1918, to support the laying of mines in the North Sea during World War I.

The installation was listed on the National Priorities List (NPL) on October 13, 1992. The facility entered a Federal Facilities Agreement (FFA) with the Environmental Protection Agency (EPA) and the Virginia Department of Environmental Quality (VDEQ) in September 1994. The FFA provided a blueprint for cleanup activities and identified 21 sites potentially needing remediation. Also identified in the FFA were 19 Site Screening Areas and 21 Areas of Concern that may require further investigation. Most of the sites are landfills containing drums of solvents, oil and grease; residues from explosives; and batteries and transformers. A more detailed description of each site follows.

**Site 1 - Dudley Road Landfill:** This ten-acre landfill was used from 1965 to 1979 for general disposal of wastes including: empty oil, paint, and solvent containers; asbestos; construction rubble; household appliances; an explosives-contaminated carbon; electrical wires; and waste oil. Seventeen tons of waste was disposed per year. According to the Preliminary Assessment report, the landfill operated as a burial pit in the 1950s and was, then, used as an unsupervised landfill.

**Site 2 - Turkey Road Landfill:** This five-acre landfill operated from the 1940s until 1981. An estimated eight tons of waste included: mercury and zinc carbon batteries; tree stumps and limbs; construction rubble; missile hardware (wings, fins, para packs); electrical devices; and unidentified types of drums or tanks were disposed at the site each year. According to the Remedial Investigation Interim Report, the site appears to have been created by pushing debris into the wetland and filling a low lying area.

**Site 3 - Group 16 Magazine Landfill:** This two-acre landfill operated from 1940 to 1970. An estimated three tons of solvents (TCE, trichloroethane, and methylene chloride), sludge from boiler cleaning operations, grease trap wastes, and Imhoff tank skimmings containing oil and grease were disposed of each year. The Remedial Investigation Interim Report indicated the landfill was created by pushing debris over a natural embankment.

**Site 4 - Burning Pad Residue Landfill:** The four-acre landfill was used from 1940 to 1975 and received about 17 tons of waste per year. Burning pad residues (possibly containing aluminum, RDX, TNT, and DNT), batteries from weapons, flyash mine casings, electrical equipment, transformers, and tree stumps were reportedly buried at the site. The site is currently used for foliage burning.

**Site 5 - Surplus Transformer Storage Area:** This 1,000-square foot, fenced area was used to store surplus transformers. An estimated 300 pounds of PCB waste was reported to have leaked from the transformers. In December 1982, contaminated soil was removed; however, there is no record of the depth of the removal. PCB-contaminated transformers were also removed. Surplus transformers now rest on the same pad as the contaminated ones. Sampling of the pad and soil at the level of the previous removal is being planned. All past testing shows PCBs have not migrated outside the fenced area.

**Site 6 - Explosives-Contaminated Wastewater Impoundment:** This three-acre area served as an impoundment to settle solids in the wastewater discharge from the explosives reclamation facilities from 1942 to 1975. TNT, RDX, TCE, trichlorethane, and cyclohexanone were discharged to the site.

**Site 7 - Plant 3 Explosives-Contaminated Wastewater Discharge Area:** TNT, RDX, TCE, and cyclohexane were discharged to the site between 1945 and 1975.

**Site 8 - NEDED Explosives-Contaminated Wastewater Discharge Area:** The site received wastewater discharge containing unspecified solvents, spent/neutralized acids, explosive's residues, trichloroethylene, acetone, and cyclohexanone from 1940 to 1975.

**Site 9 - Plant 1 Explosives-Contaminated Wastewater Discharge Drainage Area:** This natural drainage way carried explosives, contaminated wastewater, and possible substantial quantities of organic solvents from the late 1930s until 1975. TNT, RDX, and HMX may be present in the surface sediments in the drainage way or in the bottom sediments in Lee Pond. The pond may have served as a settling basin for particulates in the wastewater. During its 40-year period of operation, 5200 pounds of TNT and RDX and 1600 pounds HMX may have been discharged to the drainage way.

**Site 11 - Abandoned Explosives Burning Pits:** Ordnance and ordnance-contaminated wastes were burned from 1930 to 1950. Ashes and residues from the open burning of TNT, RDX, HMX, contaminated wastes, and contaminated sludges are thought to be present. The Preliminary Assessment Report stated residuals containing heavy metals and explosives may be buried in the pits. An estimated 200 pounds of waste may have been deposited at the site. The pits have been filled.

**Site 12 - Barrack Road Landfill:** An estimated 25 tons of garbage, refuse, scrap wood, and some explosives-contaminated packaging were disposed in this landfill from 1925 until the mid-1960s.

**Site 16 - West Road Landfill:** More than 100 tons of waste including: dry carbon batteries, banding materials, pressure transmitting fluid (possibly containing PCBs), and unknown contents were disposed at the site from the 1950s until the early 1960s.

**Site 17 - Holm Road Landfill:** An estimated six tons of acid batteries from underwater weapons, hydraulic fluids from the demilling of torpedoes, drums, and scrap metal were deposited in the 1950s and 1960s.

**Site 18 - Building 476 Discharges:** This unlined drainage ditch received battery acid discharges from the 1940s until the 1960s. The discharges are reported to have contained mercury, nickel, cadmium, and lead. An estimated 100 to 200 pounds of metals may have been discharged to the ditch during the 20-year period.

**Site 19 - Conveyor Belt Soils at Building 10:** TNT-contaminated soils have been reported around the conveyor belt between buildings 10 and 98, carrying TNT flakes. Some soil was removed in 1973 and 1974, but subsequent testing found TNT and RDX in concentration as high as 17,730 and 37 ppm, respectively. Reddish water in the drain below the conveyor belt was tested and confirmed it did not contain explosives.

**Site 21 - Battery/Drum Disposal Area:** The site is an open dump along a hillside. The northwestern side is covered with thousands of 1950s vintage batteries. The area was discovered in the fall of 1990. In the southeastern part of the hillside there is a drum disposal area. Several hundred drums from one to 55-gallon cans and drums were visible and severely corroded. Labels on some 35-gallon containers showed they originally contained dry-cleaning fluid. Dates ranged from 1955 to 1959.

### **Current Site Status**

Yorktown NWS was listed on the National Priorities List on October 13, 1992. An FFA under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 120 was signed in August 1994 to ensure future activities at the installation are taken as necessary to protect public health, welfare and the environment.

Removal Actions (RAs) have been completed for Sites 4, 16 and 21 in June 1995; Sites 2, 9 and SSA 4 in October 1995; SSA 3 and 7 in August 1996; and, SSAs 1, 2, and 5 in January 1995. Records of Decision (RODs) were signed requiring no further action on Sites 5 and 16. A ROD was signed in April 1997 for Site 12 and the RA was completed in October 1997.

The ROD for Sites 9 and 19 was signed in March 1998 and remedial action has been successfully completed. Site 6 and 7 ROD's was signed in October 1998. The ROD for Sites 1

and 2 was signed in June 1999. RODS were signed for sites 11 and 17 in 2000 and remedial action was completed.

### **Community Relations**

A federal facility may provide their own community relations program; however, it must be consistent with CERCLA, the National Contingency Plan, and the Environmental Protection Agency (EPA) policies. VDEQ staff members review and comment on documents such as Community Relations Plans, fact sheets, slide shows, etc. They also participate in Restoration Advisory Board and public meetings, as requested, visit site locations, and provide additional community relations support, as needed.

<b>VDEQ Representative</b>	<b>Information Repository</b>
Stephen Mihalko Remedial Project Manager Virginia Department of Environmental Quality PO Box 10009 Richmond, VA 23240-0009 (804) 698-4202, Fax (804) 698-4234 E-mail: <a href="mailto:samihalko@deq.state.va.us">samihalko@deq.state.va.us</a>	Jeff Harlow Naval Weapons Station Yorktown Code 09E17, BLDG 31B Yorktown, VA 23691-0160 (804) 887-4775

# Yorktown Naval Weapons Station (Cheatham Annex)

## York County, Virginia Superfund Program Site Fact Sheet

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<b>Type of Facility:</b>	Naval Federal Facility
<b>Funding:</b>	Department of Defense Defense State Memorandum of Agreement
<b>Lead Agency:</b>	Navy

### Site Description and History

The Naval Weapons Station Yorktown – Cheatham Annex Facility (Cheatham Annex) is a 1,579-acre federal facility located outside of Williamsburg, in York County, Virginia. The facility is located adjacent to the York River approximately 15-miles upstream of the Chesapeake Bay between King Creek and Queen Creek. The primary mission of Cheatham Annex is receiving, storing, packing and shipping of materials to federal facilities on the East Coast and major distribution centers in Europe. Construction on the supply facility began in 1942. Cheatham Annex was commissioned in June 1943 as a satellite unit of the Naval Supply Depot in Norfolk, Virginia to provide bulk storage facilities in the Tidewater, Virginia area. The mission of Cheatham Annex has remained essentially the same since its commissioning.

During World War I, prior to Navy ownership and activity, a portion of the current Navy property was the location of a large powder and shell-loading plant operated by DuPont, commonly referred to as the Penniman Plant. During this time the area included a city of 10,000 people and was named Penniman. The DuPont plant operated for approximately one year, with several years after World War I being used for de-militarization activities. Between 1922/1923 and 1942 the land was in private ownership and was used for farming or left idle.

An Initial Assessment Study (IAS) by the Navy was completed at Cheatham Annex in 1984. This study identified twelve disposal sites and potential contamination areas. Four of the twelve sites were recommended for additional studies. Three of these sites (identified as sites 1, 9, and 11 in the IA) are included as source areas in the NPL proposal of the Cheatham Annex facility. An EPA site inspection (SI) was completed at a portion of the Penniman Shell Loading Plant site in 1999. The EPA SI identified sources that were formerly part of the overall DuPont plant. Four of these sources have been included in the NPL proposal of the Cheatham Annex facility.

### Threats and Contaminants

The sampling results collected from the seven sources currently identified at the facility indicate contamination with semi-volatile organic compounds (SVOCs), explosives, and metals. The sources are not fully contained therefore the contaminants may be available to migrate into

adjacent surface waters. Cheatham Annex is located in an area with recreational fisheries. The only fishery sampled to date is Penniman Lake. The sample results indicate that a release of SVOCs and metals has occurred to this fishery. The other potential fisheries affected by onsite sources have not been sampled to date therefore the impact of contaminant migration into these surface waters is unknown at this time.

### **Current Site Status**

An EPA site inspection (SI) was completed at a portion of the Penniman Shell Loading Plant site in 1999. The EPA SI identified sources that were formerly part of the overall Penniman Shell Loading Plant. Four of these sources have been included in the NPL proposal of the Cheatham Annex facility. The Naval Weapons Station Yorktown – Cheatham Annex Facility (Cheatham Annex) was proposed to the NPL on February 4, 2000.

**Site 1 – Landfill Near Incinerator:** Site 1 is located along the York River behind the former location of the old incinerator. The incinerator has been dismantled. Although the exact date of dismantling is unknown, it is estimated to have occurred between 1989 and 1992. From 1942 to 1951 the landfill was used as a disposal area for burn residues and from 1951 to 1972 as a general landfill. A variety of wastes, including empty paint cans and paint thinner cans, cartons of ether and other unspecified drugs, railroad ties, tar paper, sawdust, rags, concrete, and lumber, were burned and disposed in the landfill until 1981. After this time, the landfill was no longer used. An estimated 15,500 tons of solid waste were buried at the landfill (this is a very crude estimate). The landfill occupies an area of approximately 1.3 acres, including a large metal debris pile.

A large area of debris is present to the north of the landfill. The area contains cables, conex boxes, an empty storage tank, automobiles, airplane/boat parts, and other miscellaneous items. This area was previously designated as AOC 5 – Debris Area, but is currently being managed as part of Site 1. Landfill contents (including metal scrap, wood, drums, containers and other miscellaneous debris) are exposed along portions of the western perimeter of the landfill along the edge of the marsh associated with the unnamed tributary to the York River.

**Site 2 – Contaminated Food Disposal Area:** This site is located in a grassy area in the woods behind the cold storage warehouse (Building CAD 40). The disposal pit measured approximately 50 feet in diameter and was 12 to 15 feet deep.

Based on the inert nature of the materials that were reportedly buried at Site 2, the site is not considered to be a significant source of contamination.

**Site 3 - Submarine Dye Disposal Area:** This site is located at the northeastern corner of Building CAD 15. The area is presently used as a storage lot. The dye was stored in 55-gallon drums on two or three pallets located between the warehouses. The drums corroded and dye leaked onto the ground and into the storm sewer system. During rain events, puddles containing a green fluorescein dye were observed. At times, the dye would leak into the storm sewer leading to the York River, turning the river green. The drums were subsequently removed in the early 1970s.

**Site 4 – Medical Supplies Disposal Area:** Site 4 is located along the pond just upgradient of Youth Pond, between buildings CAD 11 and CAD 12. In 1968 or 1969, out-of-date medical supplies possibly including syringes and empty intravenous (IV) bottles, and one-inch metal banding were unloaded down a bank in this area and covered with soil. It was reported that as much as 7,000 cubic yards of material was disposed at this site. Previously (date unknown), a considerable volume of these materials were reportedly removed from the site because syringe needles were getting stuck in deer hooves. After heavy rains, what appeared to be syringes could sometimes be seen floating in the adjacent pond and in Youth Pond (both upstream and downstream of D Street.) Observations in IAS field notes show that it is possible dyes were disposed of at the site. The location, volume or types of dyes are not known.

**Site 5 - Photographic Chemicals Disposal Area:** Outdated photographic chemicals (developers and fixers) were reportedly disposed in a pit, which was of unknown dimensions, in 1967 or 1968. Quantities mentioned included “20 to 40 gallons; or one pallet full, which was approximately six months’ accumulation.” This site was originally a “marl pit” located behind (southeast) of the old DuPont munitions factory area, near Second Street. During the IAS investigation, hand-sketched mapping was prepared that showed site locations. The Photographic Chemicals site is shown on the south end of Second Street and not at the location shown on the final IAS figures.

**Site 6 - Spoiled Food Disposal Area:** Site 6 is located to the west of the old DuPont ammunition factory. Reportedly, approximately 750 cubic yards of food spoiled in cold storage was buried in a 12 to 15 foot deep pit around 1970. Disposal was not ongoing, and the spoiled food had no hazardous properties. The site was overgrown at the time of the IAS.

Based on the inert nature of the materials that were reportedly buried at Site 6, the site is not expected to be a significant source of contamination.

**Site 7 – Old DuPont Disposal Area:** In the past, there has been some confusion over the location of Site 7. The IAS report depicts the site behind two recreational cabins along the York River. The Aerial Photographic Analysis, which is also referred to as the EPIC Study, depicts a possible location for Site 7 along Queen Creek, approximately 2,000 feet west of Cheatham Pond. The EPIC Study reports that a possible large, old dump was observed adjacent to Queen Creek in the 1937 photograph with an access road leading from the Penniman Plant to the possible dump. No additional descriptions for this location are presented on the subsequent photographs.

According to the IAS (NEESA, 1984), Site 7 (IAS location) received wastes from the City of Penniman and from the DuPont facility. The wastes were reported to be non-hazardous and/or inert. However, specific information documenting the types and quantities of wastes was not available. E.I. DuPont de Nemours and Company was contacted during the IAS, but specific information regarding disposal practices was not available. The surface of the site was described as level and supporting a variety of grasses. No evidence of stressed vegetation was noted during the IAS. The western, northern, and eastern boundaries of the site are clearly defined by steep banks rising an estimated 10 to 20 feet in elevation

In November 1999 a Field Investigation was conducted at Site 7 to verify the presence of a debris disposal area. One sediment sample was collected from the low lying area to the east of the bermed area. Ten test pits were excavated to confirm the presence of buried debris. Results from the investigation are summarized in the Draft Field Investigation Report. The test pit investigation revealed that debris is buried in the northern portion of the site. Aroclor-1260 was detected in the sediment sample. The Field Investigation Report recommended a follow-up investigation to characterize and define the lateral extent of the debris, determine the source of the PCB detection and assess the impact (if any) to soil, groundwater, and sediment. Based on the findings of the investigation, it is recommended that an EE/CA be completed to determine the appropriate management strategy for the site.

A subsequent shoreline hike along the York River in August of 2000, confirmed that at least one of the Old Dupont disposal sites is located in the vicinity of the two cabins. Munitions related debris was observed on the beach along with many corroded metal parts. The IAS also indicates that ammunition waste was disposed at the site (it is not clear how this determination was made).

There are at least two separate sites. Sources of contamination may be present at both of the sites. Further investigation and possible removal of sources of contamination may be required.

**Site 8 - Landfill Near Building CAD 14:** Site 8 is located approximately 300 feet north of Building CAD 14 and is estimated to be less than ¼ acre in size. The disposal area reportedly consisted of a series of trenches with typical surface areas of 2,000 feet and depths of 10 feet. The site was used at various times since the early 1940s. The site was most active prior to the opening of the Landfill near the Incinerator (Site 1). It was reported that the site was used for waste disposal as recently as 1980.

Specific information documenting disposal practices is not available. Reportedly, only non-hazardous materials such as spoiled meat, spoiled candy, and clothing have been disposed at the site.

The surface of the site is level and overgrown with tall grasses, and at the time of the IAS, there was no surface evidence of waste and no stressed vegetation was present.

**Site - 9 Transformer Storage Area:** This site is approximately 7,000 square feet in size and located adjacent to the northwest corner of Building CAD 16. Between 1973 and 1980, electrical transformers, some of which contained PCBs, were reportedly stored at the site. These transformers were awaiting repair or disposal. Between six and thirty transformers were stored at the site at a time. The storage area surface was exposed soil enclosed by an earthen containment wall. Information regarding the number of leaking transformers, the volume of PCB oil stored or spilled is not known. Transformers were no longer stored at the site after 1980 and the area was graded and covered with gravel.

The IAS recommended additional study due to the potential for PCB contamination. The Confirmation Study Step 1A (Verification), Round One (Dames and Moore, 1986) included collection of 13 soil samples from Site 9 for analysis of PCBs and 2,3,7,8- Tetrachlorodibenzo-p-dioxin (TCDD). Arochlor 1260 was the only PCB congener detected (eight of 13 samples).



TCDD was not detected in any samples. Detected concentrations of Arochlor 1260 ranged from 21 micrograms per kilogram ( $\mu\text{g/kg}$ ) to 321  $\mu\text{g/kg}$  (or 0.021 parts per million [ppm] to 0.321 ppm). No additional sampling was recommended due to the low levels of the detections (as compared to the lowest action level under the Toxic Substance Control Act [TSCA] of 1.0 ppm).

A Draft Final NFRAP Decision Document was submitted for the site in December 1999. The document was reviewed by the VDEQ and USEPA and further investigation and an ecological risk assessment were recommended. Further discussion is required to determine the action to be taken at this site.

**Site 10 – Decontamination Agent Disposal Area Near First Street:** Site 10 is located south of First Street in the southernmost part of the old DuPont munitions plant. An estimated 75 to 100 gallons of decontamination agent (DS-2) was reportedly buried at the site. DS-2, which is toxic to humans and corrosive to metals, is used for decontaminating equipment contaminated with nerve or blister agents. DS-2 is comprised of 70% diethylene triamine; 28% ethylene glycol monomethyl ether; and 2% sodium hydroxide. It is not know if the DS-2 was neutralized prior to disposal.

At the time of the IAS, the surface of the site was covered with a variety of grasses. No evidence of stressed vegetation was noted and surrounding vegetation and animal life showed no visible adverse effects.

Due to the potential presence of DS-2, the IAS recommended that a magnetometer survey be performed to locate metallic containers of DS-2. Once the existence and location of the containers was confirmed, it was recommended that the containers be excavated and their contents be determined. If leaking containers were discovered, groundwater sampling was recommended.

A magnetometer survey of Site 10 was performed in December 1985. The map shows the anomalic areas in terms of equivalent pounds of iron. While the source of the anomalies may indeed be buried metal, brick, slag, ash, or other disturbances the buried drums could also be the source of the anomalies. The mounds of soil present in the wooded area appeared to contain little iron. The magnetometer survey was summarized in the Final Remedial Investigation Interim Report. The report recommended that historical aerial photographs be reviewed to ascertain additional information about the disposal activities and that a risk assessment be performed.

The Site Investigation for Site 10 was performed in 1992. During the investigation, approximately 20 to 25 small bottles (3 inches high) were found on the edge of the wooded area. The bottles each contained a small volume of unidentified, dry yellow/brown material. The nature and contents of the bottles was not known.

As part of the Site investigation, three monitoring wells were installed within the shallow aquifer. One surface soil sample and three subsurface soil samples were collected from each monitoring well boring. Groundwater samples were collected from each well. Three VOCs (methylene chloride, TCE, and acetone), and one SVOC (chrysene) were detected in soil at low

concentrations (below applicable criteria). TPH levels were elevated in two surface soil samples. Levels of metals were typically near or below background levels.

TPH and SVOCs were not detected in groundwater. The VOC dichloropropane was detected in a duplicate sample at a level above the maximum contaminant level (MCL) but was not detected in any of the environmental groundwater samples. Acetone was detected at a low concentration. Dissolved mercury was detected at levels above the Virginia Groundwater Standards (VGS) in each of the wells but was not detected in any of the unfiltered samples.

The report concluded that the low levels of contamination in soil and groundwater did not appear to be related to DS-2 and were not suspected to be indicative of a significant source of contamination. In general, no clear evidence of drum disposal was found. Re-sampling of the monitoring wells for VOCs and mercury was recommended to confirm the Site Investigation results.

In 1997, as part of the SSP investigation Baker re-sampled the three Site 10 monitoring wells to confirm the Site Investigation results. No organic compounds were detected in groundwater. Dissolved manganese was the only inorganic detected at a concentration above the screening criteria. Mercury was not detected in any (filtered or unfiltered) samples. The SSP included human health and ecological risk screening using data generated under the SI (soil and groundwater) and under the SSP investigation (groundwater); no unacceptable risks were estimated and no additional investigation or remedial action was deemed necessary.

NFRAP status for the site is not currently planned because the source of the detected anomalies has not been determined and the buried containers of DS-2 have not been located. Before the site can be closed out it will be necessary to perform a test pit investigation to identify the source(s) of the anomalies and determine if a removal action or additional remedial activities are warranted. In addition, Site 10 will be included in the multi-site screening-level ERA.

**Site 11 – Bone Yard:** Site 11 encompasses an estimated 8-acre area located approximately 250 ft south of Antrim Road, behind the public works facility. The site was reportedly used between 1940 and 1978. Wastes believed to be deposited at the site include oil, asphalt, and gasoline. A submarine net coating, tar, operation was also reported to have occurred in this area. These wastes were contained in 15 barrels and two 500-gallon aboveground tanks at the time of the IAS. It was reported that unspecified wastes might also be buried at the site.

During the IAS, scrap metal, old containers (fuel oil, mixing tanks, etc), fence posts, and abandoned cars were found inside the gate within an estimated 1-acre area. Various discarded clamshell buckets and other surplus metal objects used in heavy construction were also located throughout the area. Approximately ten 5-gallon containers labeled “paraplastic” (concrete sealant) were also present.

South of the entrance, numerous barrels containing petroleum products were discovered, as well as several 500-gallon square tanks containing asphalt or oil used in making asphalt. These tanks were reported to have leaked in the past.

Numerous tar cylinders were deposited at the end of the road leading into the site. The cylinders had apparently been there for quite a while, as their initial cardboard containers had decomposed and the tar had melted. Numerous pieces of scrap metal and surplus construction equipment were scattered along the path. It was also reported that uncharacterized wastes may have been buried in this area, but this was not confirmed by other reports or signs of stressed vegetation.

Based on descriptions from the IAS, the wastes deposited at this site have included oil, possibly from automobile maintenance and/or fuel oil sludge, gasoline, and asphalt oil from road maintenance supplies.

The Confirmation Study Step 1A (Verification), Round One included collection of three surface water and three sediment samples, and installation of three shallow monitoring wells. Groundwater samples were collected from each of the three monitoring wells. A total of nine soil samples were collected – one composite sample from each of the monitoring well borings, and six discrete samples were collected from locations throughout the site. A total of 18 samples were collected from 15 drums (three of the drums contained a liquid phase which was sampled)

The Confirmation Study Step 1A (Verification), Round Two included collection of three surface water and three sediment samples co-located with the Round One samples, and collection of a second round of groundwater samples from each of the three monitoring wells which were installed during Round One.

The Final Remedial Investigation Interim Report reported that most of the 55-gallon drums and scrap metal had been removed from the site since the IAS. This report, which characterizes the site as more of a scrap yard than burial site, summarized the findings of the Confirmation Study. Significant potentially site-related detections during the Confirmation Study included:

Toluene, 111-TCE, phthalates, PAHs, oil and grease, and lead in soil;

Total phenols, lead, and oil and grease in groundwater;

1,1,1 – TCE, methylethylketone, methylene-chloride (potentially laboratory-related), total phenols, and phthalates (potentially sampling-related) in surface water samples;

1,1,1 –trichloroethane (TCA), lead, and oil and grease in sediment; and,

Leachable lead, cadmium, and barium (as indicated by [EP] toxicity testing) in drum samples.

The report recommended the site for further investigation to better define the nature and extent of contamination at the site.

The Site Investigation for Site 11 (Weston, 1994) included a soil-gas survey, a collection of 14 surface soil samples, an installation of two monitoring wells with soil samples collected from each boring, a collection of groundwater samples from the newly installed and existing monitoring wells, a collection of 16 sediment samples from eight locations, and a collection of five surface water samples.

Significant potentially site-related detections during the Site Investigation included:

Low levels of benzene, toluene, ethylbenzene, xylenes, and total volatile hydrocarbons in soil-gas samples;

TCE, 1,1,1-TCA, toluene, xylene, PAHs, TPHs, lead and several other metals in surface soil;

TPHs, lead and other metals in subsurface soil;

TCE, 1,2 dichloroethene, carbon disulfide, lead and other metals in groundwater;

TCE, 1,2-dichloropropane, iron and manganese in surface water; and,

TPHs, PAHs, arsenic, beryllium, and lead in sediment.

The Site Investigation concluded that previous activities at Site 11 have had some impact on shallow soils, marsh sediments, and lake sediments, but very little to no impact on groundwater and surface water. Potential for further degradation of the environment was minimal. The report recommended that the drums and asphalt tank remaining on site be removed. Confirmation of TCE detections in surface soil, VOCs and dissolved metals in groundwater, and TCE at one surface water sample location was also recommended.

The SSP investigation included collection of an additional round of groundwater samples from each of the Site 11 monitoring wells. No organic compounds were detected. Concentrations of total (unfiltered) metals were significantly lower in the 1997 samples than in previously collected samples due to the employment of low-flow sampling during the SSP investigation. The SSP report concluded that no additional investigations be conducted at Site 11.

At the time of the SSP groundwater investigation (August 1997), approximately 60 drums were noted in the woods along with three tanks that contained tar. Approximately one half of the drums were empty. The remaining drums contained one or a combination of the following: tar, leaves, soil, or sludge. The location of the area containing the tar drums and tanks is shown on Figure 4-11. Industrial Marine Services, Inc. of Norfolk, Virginia removed the drums and tanks from the site in early September 1997. Adding sand prior to removal from the site solidified the tar. Approximately 60 tons of material, including drums, tanks, solidified tar, and miscellaneous scrap/materials was disposed as non-hazardous waste. Rainwater, which had accumulated in the largest tar tank, on top of the tar, was evacuated from the tank via vacuum truck and discharged to Industrial Marine Service's treatment facility at Norfolk, Virginia.

In November 1999, a Field Investigation was conducted at Site 11 to determine soil conditions within the area of the 1997 removal of tar drums/tanks. A total of six surface soil and six subsurface soil samples were collected.

The Draft Removal Closeout Report summarizes removal activities that have occurred at Site 11 – Bone Yard. In November 1999, Baker conducted confirmatory sampling at Site 11 at the request of VDEQ.

At the time of the previous investigations it was believed that the tar was previously used for roofing or paving. However, Baker has recently learned from anecdotal accounts that the site and surrounding area was the former location of a marine netting/cable coating operation.

**Site 12 – Disposal Site Near Water Tower:** Site 12 is located approximately 2000 feet west of Jones Pond. The site was used for surface disposal of scrap metal; primarily old automobile parts and iron pipe. Based on visual inspection of the site approximately 10 to 110 cubic feet of material was disposed at the site.

The EPIC Study (USEPA, 1998) indicates that a small mound of dark-toned material is present at the site in 1955, but not present in 1963. It is not clear from the IAS whether the debris was present at the time of the IAS, or if it had already been removed. The debris is no longer present at the site. One possibility is that the debris was relocated to one of the nearby unnamed tributaries to Jones Pond. Large quantities of debris are present in these tributaries in the areas that AOC 1 – Scrap Metal Dump currently occupy. Debris similar to that described for Site 12 in the IAS is visible in these areas.

Based on the inert nature of the materials that were reportedly disposed of or stored at Site 12, the site is not considered to be a significant source of contamination.

**AOC 1 – Scrap Metal Dump:** AOC 1 is a debris disposal area located just west of Chapman Road within two ravines associated with unnamed tributaries to Jones Pond. Wood and metal debris outcrop from the banks of the ravines, with debris being more extensive within the southern ravine. There is orange staining in the unnamed tributary that receives runoff from the southern ravine. This discoloration may be a result of natural oxidation processes and is not necessarily indicative of site contamination. This location was designated as an AOC in 1998 following site visits by LANTDIV, USEPA, and VDEQ representatives.

Two cylinders are present along the top of bank along the northern ravine. From information presented in the September 30, 1998, letter from Mr. Robert McGlade (Roy F. Weston), the two cylinders, which are 8 inches in diameter and 54 inches long, are severely corroded. Markings were distinguishable on both of the cylinders, and included raised lettering around the neck “THE LIQUID CARBONIC CO.” The cylinders have intact valves and welded base supports.

AOC 1 is not specifically identified in the EPIC Study. However, in 1942, the area had been cleared of trees and contained a large mound of light-toned material. The adjacent rail yard was under construction at the time. In 1955, the area was partially revegetated, and in 1963 a large mound of fill was noted. By 1975, the area appeared to be revegetated.

In November 1999 a Field Investigation that included a geophysical survey and collection of soil, surface water and sediment samples was performed. VOCs, SVOCs, pesticides, PCBs, inorganics, and cyanide were detected in the surface soil samples. SVOCs and inorganics were

detected in the surface water at low levels. VOCs, SVOCs, PCBs, and inorganics were detected in the sediment samples. The extensive volume of debris at the AOC is a potential source of contamination.

The Draft Site Inspection Report recommended that a limited investigation to evaluate disposal parameters be performed. In addition, an EE/CA was recommended to evaluate the most appropriate means of removing or covering the debris that is present at the site.

**AOC 2 – Dextrose Dump:** AOC 2 was discovered during site visits performed by LANTDIV, USEPA, VDEQ, and Baker in late 1997 and early 1998. The area is situated in woods, north of Garrison Road, along the southern perimeter of CAX. The area contains several rows of concrete foundation piers which at one time apparently supported a Shipping House associated with the former Penniman Shell Loading Plant. The majority of the structures associated with the Penniman facility was demolished somewhere between 1918 and 1925. There is no evidence of the structure other than the foundation piers. However, grass-covered lanes that lead to the area are likely locations of former rail lines that have been removed. Several glass bottles (many of that are labeled dextrose) were present both upon the ground surface and partially buried. In addition, several partially buried drums (apparently empty) were also noted. Mounds of soil that are present may also be indicative of buried materials. One buried drum (which can be seen through a void in the ground) is present to the east of the abandoned foundation. It is suspected that additional buried drums may be located in this area.

During May 1998, Reactives Management, Inc. removed a total of 470 bottles from the site as part of a routine housekeeping operation. Approximately 5 percent of the bottles (24 bottles) were selected randomly and analyzed. Each bottle contained greater than 2,000-ppm glucose indicating that the bottles did contain dextrose, as suspected. The contents of the bottles were emptied into the Hampton Roads Sanitation District (HRSD) sanitary sewer system. The bottles were rinsed, allowed to dry, and transported to a local glass recycling facility. This operation was limited to bottles present at the surface. Partially buried bottles are still present at the surface.

In 1998, Baker performed a Field Investigation for AOC 2 that consisted of a geophysical survey, and soil and groundwater investigations (including installation of temporary monitoring wells). VOCs, pesticides and inorganics were detected in the soil samples at low levels. SVOCs and inorganics were detected in groundwater samples at low levels. The presence of these constituents was not suspected to be related to site activities.

The Field Investigation Report recommended that the sources of the geophysical anomalies and potential sources of contamination be identified by excavating a total of six shallow test pits in the vicinity of the most significant anomalies detected.

In November 1999 Baker performed a Field Investigation that included test pits and exploratory hand auger borings to define the lateral extent of buried debris at the site. Samples of native soil and soil within the debris zones were collected. During the investigation, a large volume of buried drums and respirator filter canisters were encountered. A few of the drums contained a thin layer of tar coating or residue. The remaining drums were empty. One sample of tar was

collected and submitted for laboratory analysis of chemical warfare materials (CWM) and degradation products. No CWM-related constituents were detected and the sample was determined to consist of a heavy hydrocarbon material (i.e., tar). One of the respirator cartridges was submitted for Toxicity Characteristic Leachate Procedure (TCLP) analysis and determined to be hazardous due to elevated cadmium and lead.

In the Draft Field Investigation Report, additional geophysical surveying with confirmatory test pitting was recommended to further delineate the extent of buried debris, with emphasis placed on locating areas of buried respirator cartridge canisters. Based on the findings of the investigation, it was recommended that an EE/CA be completed to determine the appropriate management strategy for the site.

**AOC 3 – CAD 11/12 Pond Bank:** AOC 3 consists of an approximately 20 foot by 20 foot by 10 foot high pile of metal banding along the north bank of the unnamed pond, north of D Street. The pond is situated between Buildings 11 and 12. This area, which also contains a few empty drums, is adjacent to Site 4. LANTDIV, USEPA, and VDEQ representatives designated this location as an AOC in 1998 following site visits.

During the 1999 Field Investigation two soil samples and two sediment samples were collected immediately adjacent to the metal banding pile. This area will be managed separately from Site 4. The samples collected during the 1999 Field Investigation were intended to determine if future investigation is warranted and to confirm that there are no sources of contamination present within the pile so the pile can be removed as part of a housekeeping measure, rather than under a removal action.

**Penniman AOC:** There currently are five sub-areas within this AOC, additional sites may be added as investigations proceed.

*Ammonia Settling Pits* – This area consists of earthen ammonia settling pits that were part of a former shell loading area located on Cheatham Annex. Wastewater from an ammonia finishing building was discharged through these settling pits.

*TNT Graining House Sump & TNT Catch Box Ruins* – These areas consists of a concrete-lined, open top pit believed to be the sump pit for the Trinitrotoluene (TNT) graining house in the former shell loading area. The catch box ruins area consists of an earthen, brick-lined depression located immediately adjacent to the TNT graining house in the former shell loading area. This area was used to separate TNT particles from wastewater. Both sites are located near the dam at Penniman Lake.

*Waste Slag Material* – This area consists of waste metallic slag material that is located throughout the shell loading area predominantly along the railroad tracks.

*1918 Drum Storage* – This area was used for the storage of 55-gallon drums when the shell loading area was active. The site is currently a yard area around facility buildings.

These five sub-areas have not yet been investigated.

## Community Relations

Cheatham Annex has combined with Naval Weapon Station Yorktown's Restoration Advisory Board (RAB). RAB meetings are held Quarterly at York County's Charles E. Brown Park.

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